THE

SOUTHERN AGRICULTURIST.

APRIL, 1836.

PART I.

ORIGINAL COMMUNICATIONS.

The Effects of Emigration—continued.

Mr. Editor,—The statements in my last communication, that the inevitable result of the Western demand for operatives, would be a fall in the price of lands from which those cultivators will be removed, was founded more on fact, than conjecture; large quantities of fertile land on our sea-board are offered for sale, and a small proportion only sold, at a diminished price. As well might we attempt to arrest the current of the Mississippi, as to impede the tide of emigration flowing into its valley. My object is to suggest such changes in our mode of cultivating the rich lands of the sea-board as shall prevent their total dereliction. As practice is better than precept, it is proposed to review certain modes of cultivating rice, which substitute animal for human labour, and sometimes do away with the necessity of either.

The expense attending a river-swamp plantation, where rice alone is cultivated, diminishes so materially the profits of this branch of agriculture, that a change should be introduced to lessen, not only the annual current expense, but the amount of capital invested. It is worth the investigation to inquire, whether rice cannot be cultivated in the same manner as other grain is cultivated in Europe and the Northern States? The land in those countries is always prepared by animal power; ma-

nuring, ploughing, harrowing and trenching being performed by horses, mules, or oxen. The grain is reaped with a cradle, and threshed by machinery. By these means, the proportion of land cultivated by each labourer, far suppasses the usual average of five or six acres cultivated under our present system, where nearly the whole operation of husbandry is carried on by human power. The principal difficulty in substituting animal for human labour, arises from a want of method, in procuring proper animal food, and feeding it away judiciously. The experience of nearly all ages and climates, informs us that hay is the proper food for animals that work. A small portion of good land with very little labour applied, furnishes abundance of this excellent food for oxen, mules or horses, sufficient of itself to keep mules and oxen in order during the winter, while they are constantly and moderately worked. Every plantation that has a few acres of low ground, may be made to produce large crops of hay. The quality of the grass depends upon the preparation of the land, and the time of mowing it. If ground be kept tolerably dry, ploughed in winter, and harrowed in spring, three cuttings of crab, or crop-grass, may be procured. A man with a briar-scythe can cut half an acre per day, and a woman with a hay-fork can tangle an acre and rake it into small stacks by sun-set: these should be opened after the dew is off the next morning, and either housed or stacked before evening; much exposure to the sun destroys its nutritious quality. Two or three tons of this hay may be made from every acre of swamp land properly prepared: more may be made of rice-grass, which is better adapted to low ground, and does not require as much draining.

I would, therefore, suggest, as indispensable to the economical use of animal power, a resort to the food used in those agricultural countries, where animal power is employed to the greatest advantage. The quantity of hay necessary for working animals, is diminished to nearly one-half by chopping and mixing a small portion of rice-flour, or corn-cob meal with it.

The price of horses, the expense of feeding them, and their liability to disease and abuse, renders them ineligible for plantation work. Where there is much summer ploughing the mule is preferable; but for the culture of rice and hay, the ox is sufficient. The objection to ploughing soft

swamp-land with a yoke of oxen, and miring the ox that walks in the furrow, is obviated by using a light plough, drawn by a single ox with wooden haims and cow-hide traces, driven by a bit and lines, if broken young, they are as docile as the horse, or mule, and unlike them, increase in value every year.

Repeated experiments have proved that fair crops of rice may be made without stirring the ground after sowing. Let the land be ploughed in winter, harrowed in the spring, and trenched; all which, are, or may be, performed by animal power. Let the seed be soaked not less than twelve hours before it is sowed in the open trenches, the water then put on and freshened at every change of the moon, and a crop of about forty-five bushels per acre, may be expected in good seasons. The water culture affords more time for harvest, as the grain ripens nearly a fortnight sooner, and is therefore less liable to injury from birds and storms in September. The objections to this plan are:—

1st. The rice sowed in open trenches, in March, is liable to the depredations of wild ducks.

2d. Leaks in the banks or trunks, make it difficult to keep the fields under water during neap tides.

3dly. In fields kept constantly under water, the inner banks are injured by the action of the water dashed against them by every high wind; and

4thly. The lands are polluted with water-grasses.

For the first objection, there are two remedies:—plant for the water-culture in April, and if the fields are then annoyed by ducks at night, let the water be drawn off with the evening's ebb, and put on with the morning's flood. The gun may be also used at night. To the 2d objection—Trunks and banks should be made tight before planting, but as this plan is proposed for rendering a diminution of human labour practicable, it is suggested that the fields easiest flowed should be put under water culture. 3d. The injury sustained by the washing of the inner side of the banks, is much obviated by never hoeing the sides of the banks, and thus allowing a growth of coarse grass on them which prevents their being washed; the rice itself on the margins will protect the banks, as soon as it grows a few inches above the water. The 4th objection is the only valid one; and furnishes the reason which heretofore induced the abandonment of the

practice. It is only proposed to revive it, that an attempt may be made to overcome the objection, by introducing a succeeding crop, which has not been attempted, and is of material importance to the animal husbandry here recommended. Let the field which is thus kept under water in the summer, be kept entirely dry afterwards, and turned into meadow. As soon after harvest as practicable, let it be ploughed up, and the grass roots thus exposed to the action of the frost. Let it be harrowed in the spring, kept dry, and whatever grows on it should be mowed in June. Meadows are improved by every mowing; the effect is the production of grass, and destruction of weeds. The coarsest grass or weeds, if cut and cured, form tolerable winter food for stock. Another expedient for destroying water grass, is that usually adopted to cleanse a field polluted with volunteer rice. Sow with oats in February, and afterwards plant slip potatoes: much of these operations may be performed by animal power, and the oats harvested with a cradle; the only objection to cultivationg them arises from the inconvenience of harvesting in June, when the utmost diligence is required to keep down the grass in the rice-fields, cultivated with the hoe.

To undertake these experiments with any prospect of success, it is of the last importance that the threshing mill be used. The great difficulty of putting land in order, when the people are employed every fair day in threshing by hand, would render any diminution of their force fatal to our attempt. To succeed in husbandry, it is necessary that the land be put in the best order of which itis susceptible. In addition to the attention bestowed on the surface, so much more is required for the preservation of the banks, trunks, drains and ditches, that no time can be spared for the threshing-floor and winnowing house. The introduction of canals and harvesting by flats, has materially diminished the labour of that operation. Broad wheeled wagons have also been used where the nature of the soil, and the situation of the barn-yard and fields, rendered them desirable.

I have thus suggested, Mr. Editor, a partial change in the present mode of cultivating rice, which should be as gradual as the necessity of the case permits: and rather advised experiments on a limited scale, where circumstance allow them, than insisted on their success. Hav-

ing extended this communication to an unusual length, I must reserve some further considerations of the subject for a future number.

Your's, respectfully, &c.

C. C. PINCKNEY.

Agriculture of Italy.

Mr. Editor,—Since you desire it, I resume my account from Chateauvieux, on the Agriculture of Lombardy.

Before I continue my extracts, however, allow me to enforce attention to one especial point of conformity between Italian cultivation, and that which is the true course of our own. Of the former, one of the leading excellencies lies in the skilfully multiplied objects of production, which it is made to embrace. As a general rule, the warmer the climate, the more varied the culture may be made; and the greater is the scope for improving the soil and augmenting and diversifying its fruits, by the intermixture and succession of crops. In no country has less art been applied to these matters, than in our own: in few countries, I am persuaded, is so much practicable, in this species of improvement, as under our genial sky and with the fine soil of our alluvial country.

I cannot but think, too, that the Italian economy of employing oxen, for draft and the plough, might well be introduced, to a considerable extent. In hardiness and in the cheapness of their food, the mule may be equally commendable. But the outlay of capital is, for the oxen, far less; their breeding is far easier and cheaper: in what relates to the forming of manures, they are much to be preferred; and besides, the milk and butter of a well-kept herd, there is some account to be made of the food into which the superannuated ones may always be turned. Their superiority, however, for all the purposes of rural employment, is greatest to the cultivator whose capital is small, or scanty in proportion to the lands that he tills; and this, after all, is the condition of even our wealthiest planters.

I proceed to the detail of the cultivation practised upon the farm which was described in my former paper.

It is of 60 arpens (75 acres) in extent, of which a fourth part is in grass, the rest being in plough lands,

generally planted: of which last, about 10 (12½ acres) are sown in clover. This latter crop, with the hay of the meadows, feeds eight oxen and thirteen cows and yearlings; of which two are young oxen; together with an indifferent horse, employed only to go to market and to tread out the grain. In all, there are 22 head of cattle, nearly one to every *arpent* of forage land.

I need not describe their peculiar race of cattle, since we have them not in this country. They are, perhaps, superior to the English breeds, for purposes of draft, but much inferior for the milk-pail. The Piedmont system, therefore, looks more to profit from the flesh than from the milk of their cows. Thus, on each farm, a pair of oxen is raised every year. In their third year, they are broken to the lighter labours of the farm. In the fourth and fifth, they are used for the heavier work. At five years old, they are fattened, bringing often 1000 or 1100 *francs*, (200 to 220 dollars,) and forming one of the farmer's best sources of income.

Each plough works over in the season 32 *arpens*, (40 acres.) Their plough is an admirable and peculiar one, which they manage with extraordinary skill. With it alone, their open crops are all cultivated. By it, and with a yoke of oxen, their maize is hoed and hilled up, with the greatest neatness and exactness, so as totally to destroy all grass or weeds; and their very fine Irish potatoes are also produced with this single implement.

Their course of crops is usually a four year's rotation.

First year, Maize, with manure,
French Beans,
Hemp,
Second year, Wheat,
Third year, Clover, ploughed in after the first mowing, and left fallow,
Fourth year, Wheat.

This system, productive as it is, (two wheat crops every four years) is found to sustain, without diminution, the fertility of the soil—a result, however, largely attributable to the manure furnished by a meadow mowed three times in the season, of which the hay is all returned by the cattle that it feeds, to the plough-lands.

The maize-crop is regarded as a preparatory one. For it, all the manure is reserved; and its hoeings and hillings-up keep the land perfectly clean. Its produce

is considerable, and makes, under various forms, the general food of the Piedmontese peasantry. With it, in the cultivation, they mingle an abundance of beans of different sorts, and a quantity of hemp.

The maize is got-in in September, and the soil is forthwith prepared for wheat. This is sown on very narrow beds, and covered in by the plough. No further attention is given it, till harvest, which comes about the beginning of July.

The wheat, as soon as under the porticos of the court, it is dried by the heats of August, is threshed by a roller, drawn by a horse, and driven by a child, whilst the labourers shift the straw with forks. This operation lasts about two weeks, and is prompt, economical, and efficient.

The clover is sown in spring, among the manured wheat. The warm sun of Italy brings it into blossom early in the autumn, and it gives in October a good cutting; after which it serves with the meadow for a fall pasture. In spring, it starts up afresh, flowers early, and gives a fine mowing; but the coming heats leaving no hope of another good growth, they make haste to plough it in: and thus the land has a fallow and three ploughings before the new sowing of wheat.

Thus, their course gives, in four years, three crops of human food, one fallow, and two crops of food for cattle; besides the hemp crop, which is sometimes valuable, and those of silk, wine, vegetable, fruits, poultry, calves, the produce of the dairy, and the profits from the fattening of beeves.

A farm, then, such as described, supports the farmer's family of eight or nine persons, feeds twenty-two head of cattle, of which two oxen and one cow are fattened for market every year; gives a produce of silk, worth fully 25 Louis d'ors; supplies more wine than the farmer uses; yields, in beans and and maize, more than enough to support the cultivators; and sends to market the entire wheat crop, as well as a quantity of smaller articles of provision. After this, it is easily seen that the economy of cultivation is no where in the world better understood than in Piedmont; and the phenomenon of its great population and exports becomes intelligible enough.

I will endeavour, in a subsequent paper, to pursue those further points in this account of Italian cultivation, which seem to me likely to prove useful to your readers.

E. W. J.

Account of the Medical Properties of the Grey Sulphur Springs, Virginia.

We have been presented with a small pamphlet, bearing the above title, through the politeness of John D. Legaré, Esq. the former editor of this journal, and present proprietor of the Grey Sulphur Springs. From the account given of the medicinal properties of these waters, it appears, that the public are beginning to appreciate their valuable effects. Such has been the patronage they have received, that Mr. Legaré has been induced to enlarge his accommodations very extensively, and is now prepared for the reception of any number of visiters, who may resort to the springs, during the ensuing season, either for health or pleasure.

The following extract, from the pamphlet, will give some idea of the situation and properties of these waters.

"The great reputation which the Mineral Springs of Virginia have of late years acquired, cause them to be resorted to, in great numbers, not only by invalids from every section of the United States and foreign parts, but also by individuals of leisure and fashion, whose principal object is, to pass the summer in an agreeable manner. The properties of the Warm, Hot, Sweet, White Sulphur, Salt Sulphur and Red Sulphur Springs are generally known. Those of the Grey Sulphur having been ascertained only within the two last years, have yet to be made public, and in order to do so, we are induced to give in this form, an account of the situation and medical properties, together with a statement of some of the cases benefited by the use of the waters.

The Grey Sulphur Springs are situated near the line, dividing the counties of Giles and Monroe, Virginia; on the main road leading from the Court-House of the one to that of the other. They are ¾ of a mile from Peterstown, 9 miles from the Red Sulphur, and by the County road, 20¼ miles from the Salt Sulphur Spring. In travelling to the Virginia Springs; by either, the main Tennessee, or Goodspur Gap roads, and crossing the country from Newbern, by the stage road to the Sulphur Springs, the Grey Sulphur are the first arrived at. They are 30 miles distant from Newbern. The location is such as will admit of many and varied improvements, which when completed, will render this spot an elegant and desirable resort during the summer months, independent of the high medicinal properties of the Mineral Waters.

The present improvements consist of a brick Hotel 90 feet long, and 32 wide; two ranges of cabins 162 feet long each, which, with other buildings in connexion, afford accommodation for from 80 to 100 visiters.

There are two Springs at this establishment, situated within five feet of each other and inclosed in one building. Although rising so near to each other, yet they differ most materially in their action on the

system. Both appear to be peculiarly serviceable in dyspeptic cases, and in such as originate in a disordered state of the stomach—the one in those, in which inflammation exists, the other in such as proceed from torpidity. They have hitherto been known as the Large and Small Springs; but having succeeded towards the close of the last season in procuring a much larger supply of water at the Small Spring, than is afforded by the Large, a change of names became necessary. The Large will hereafter be known as the Anti-dyspeptic, and the Small as the Aperient, which names will serve to point out their peculiar characteristics.

These Springs have been classed by Professor Shepard, as "*Alkalino Sulphurous*," a variety so rarely met with, that another is not known to exist elsewhere in the United States. The waters are beautifully clear, and highly charged with gas, which render them light and extremely pleasant, especially that of the Anti-Dyspeptic Spring, which produces none of those unpleasant sensations so frequently felt on the first drinking of Mineral Waters.

When first purchased some of the water was submitted to a chemist for analysis; the quantity, however, was too small for him to ascertain all its ingredients. A more recent examination has been made by Professor C. U. Shepard, who has furnished us with the following abstract of an article which appears in the April Number (1836) of Professor Silliman's Journal of Science and Arts.

"The following is the most satisfactory view which my experiments enable me to present of the condition of these Waters.

Specific gravity, 1,003,

SOLUBLE INGREDIENTS.

Nitrogen,
Hydro Sulphuric acid,
Bi-Carbonate of Soda.*
A Super Carbonate of Lime,
Chloride of Calcium,
Chloride of Sodium,
Sulphate of Soda,
An Alkaline or earthy Crenate, or both,
Silicic acid.

INSOLUBLE INGREDIENTS.

Sulphuret of Iron,
Crenate of Per Oxide of Iron,
Silicic Acid,
Alumina,
Silicate of Iron.

My experiments do not permit me to point out the differences between the two Springs with precision. The new Spring appears to give rise to a greater amount of hydro-sulphuric acid, as well as of iron and silicic acid. Probably it may differ in still other respects. I have not examined it for Iodine or Bromine."

* It cannot be determined whether free carbonic acid exists in these waters without going into a quantitative analysis.—*C. U. S.*

As no regular analysis was attempted, the quantities in which these several ingredients exist, still remain undetermined. That they are in different proportions in the two Springs, is evident not only from their deposites, but also from their action on the system. The action of the Anti-Dyspeptic Spring is diuretic and gently aperient, tending to restore the healthy performance of the functions, and reduce or diffuse the local irritations of disease. The Aperient Spring while it possesses all the alkaline properties of the other, has an aperient and alterative action. Possessing more iron, (of which the other has but a trace,) it acts more powerfully as a tonic, whilst its other ingredients cause it to act *in some cases* as a very powerful aperient.

As these Springs have been visited by invalids, only during the two last seasons, it is reasonable to suppose that all their properties have not yet been discovered, nor all the cases ascertained in which they can be beneficially used. In fact, owing to the small quantity of water furnished hitherto by the Aperient Spring, its qualities have been but little tested, and there can be no doubt, (judging from its constituents) that it will be found equally salubrious as the Anti-Dyspeptic Spring, only better adapted to another class of cases. To give a general idea of the properties of these waters, we might say that they are peculiarly serviceable in those diseases which originate in a disordered state of the stomach and bowels, and also in hepatic affections. It is proper, however, to enter more into details, and we therefore, submit the following synopsis of the medical properties of the *Anti-Dyspeptic* Spring.

Medical Properties.

1. It relieves nausea and headaches, arising from disordered stomachs.
2. Neutralises acidity, and if taken at meals, or immediately after it has a tendency to prevent those unpleasant sensations so often experienced by invalids, from indiscretion in dieting.
3. Is an excellent tonic, exciting appetite and imparting strength to digestion.
4. Quiets irritation of the alimentary canal.
5. Controls and lessens the force of the circulation when unnaturally excited by disease, and often in this way, is remedial in internal inflammation of the organs.
6. It tranquilizes nervous irritability.
7. Is a mild and certain expectorant, often allaying dyspnœa, and promoting recovery from chronic ailments of the chest or wind pipe.
8. It alters the action of the liver where this has been previously deranged, in a manner peculiar to itself, and under circumstances in which the ordinary alteratives are forbidden by reason of their excitive, or otherwise irrelevant properties.
9. It is also sudorific or diaphoretic; and
10. When taken at bed-time, often proves itself soporific: apparently stilling that indescribable, but too well understood inquietude, which so frequently and unhappily interrupts or prevents the repose of the invalid, and especially of the dyspeptic.

Having thus briefly stated the properties of this Spring, we submit the following statement of cases, treated at the Grey Sulphur, illustrative of the effect of the waters, and in corroboration of what has been advanced. Except those which are noticed in their proper places, all are either directly from the pen of the sufferers themselves, or were immediately dictated by them in the form in which they appear in the

notes. The originals are in our possession, signed by the individuals, whose cases are referred to.

The pamphlet contains letters, from some of the most scientific gentlemen throughout the Union, recommending these Springs to the attention of invalids.

Ditching, Fencing, &c.

Maybenton, February 22, 1836.

Mr. Editor,—I present you my opinions on the economy and management of an up-country plantation.

1st. In reference to Ditching and Fencing our hilly lands.

2d. Manures, and their application to different productions; with a contrast of the general economy in the substitution of small grain for our corn-crop.

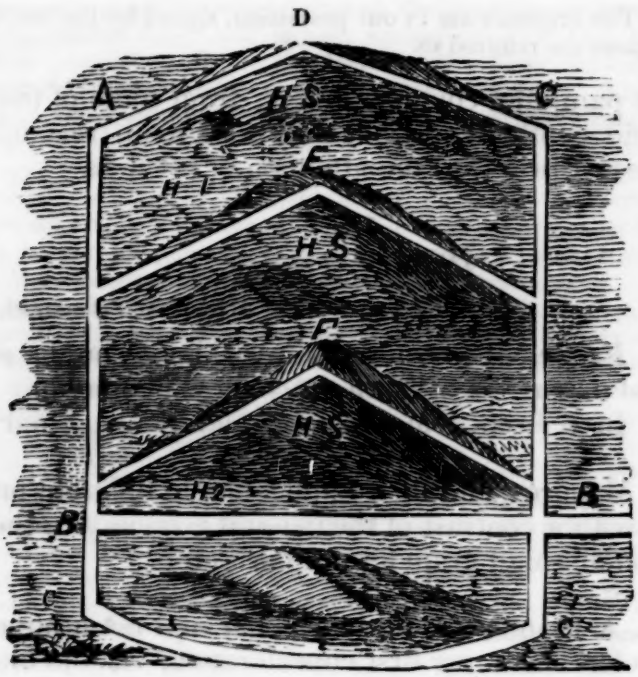
3d. Stock.

4th. A Planter should be a seller and not a buyer.

In reference to my first consideration, viz. ditching our hilly lands, the practice in this section of country is new, but one creating great interest.

In riding into a field for the first time, even with those equally skilled with himself, the ingenuity of the proprietor is often perplexed, in explaining his policy in ditching. A thorough acquaintance of collateral circumstances being essential, before all can be seen into. Many, however, differ in opinion, as to the mode of ditching. I should by all means make my ditches straight and deep. This labour is not lost, when its value is estimated. With a plough and hoes succeeding and pulling the dirt on the lower side, it is not only speedily and easily done, but with hedges a good fence can be made. These ditches should, for the latter purpose, be sufficiently far apart; as a short space, or a precipitous hill does not collect water enough to injure by washes; indeed, it is only a long gradual hill that does wash.

Supposing two hollows, and four consequent hill-sides running through a ten acre field, there is always a declivity on both sides—*(see ditches in diagram annexed.)*



Cut ditch A: at its upper end it receives the water from the eminence D: ditch C receives it on the other side. Ditch A, crosses the hollow 1, where it is assisted by a dam and deeper ditch, and receives the water from ditch E. Ditch C crossing the hollow, receives the water on the other side. Now continue ditches A and B across hollow 2, down to ditch B, and all the water from ditch F will be carried off from both sides. By this arrangement, your ditches are not only rendered square; but hollows 1 and 2 are preserved, which are, perhaps, worth more than all the other land. In reference to the fences, they should be put on the lower sides of ditches A, B, C and D, the others being small ditches; the object in putting the fences here, is to secure the sides of the ditches, until nature has by its occasional assistance, adapted the wash to its new channel.

Suppose the ditch B, that conducts the water from the hills and hollows, penetrates a body of river, creek, low grounds, through all the varieties of consistence, (stiff pipe clay, or isinglass.) Each of the varieties, by the addition of sand, is made inconceivably fertile; indeed, there is no appreciating their intrinsic value. Dam up the ditch and it soon fills up with sand, covenient to the soil demanding it. The sand thus collected may have

a richness added, by the peculiarities of its channel. It is, however, certain, no other application to low lands is at all comparable to it. Lime has an assimilating tendency in mellowing the land, but it is not so permanent.

2d. Manures and their application.

Manures, as usually prepared, are much injured by exposure to the sun. After the leaves are sufficiently trodden, there should be on a common declivity or escape, a pit 10 by 25 feet, 4 or 5 feet deep, with ditches around the pen, leading to it; over this pit a cover, protecting it from the sun, but admitting rain; on every scraping deposited in this pit, put one bushel of lime. Some are in the habit of adding to their stable manure, their cotton seed; others rot it separate—either plan is very exceptionable, as it is as much injured by rotting, as it is rencered inefficient by vegetating when applied. Every gin should have a couple of rollers, operated by the band wheel, to receive and mash the seeds for manure, after which it should be under shelter until used.

Manure being thus far preserved with all its strength, a question is presented, how it can be best preserved in the application. The observation is common that on a piece of worn-out land, little benefit results from the first crop, in applying manure only to the hill; the second year applying it again to the hill, the benefit is very perceptible, and every succeeding year more beneficial. It is the stimulus that every inch of the land needs, in addition to the manure, that produces this result. This remark is confined to corn and cotton, and not to the case of small grain. Precede this application of manure to the corn-hill, with a wheat crop, and you have a full benefit from the stubble left after culture; the whole soil seems to be thus invigorated.

This fact has induced many to plant extensively of wheat, and I am now fully convinced that our corn-crop should be, in a measure, abandoned for a small grain crop.

An acre of land that would yield 20 bushels of corn, would yield 30 bushels of wheat, and 40 bushels of oats. Some say that wheat is an uncertain crop in this climate. I, however, know some farmers who never have failed to produce a crop. Our small grain crop is planted at a time when we have little else to do. Our corn, at a season conflicting with our cotton preparation. We plant

five acres of corn to the hand, and take the State generally, it will not average 12 bushels to the acre. Grant we can make two bushels with manure; put the same manure on 8 acres, 6 planted in oats, and 2 in wheat. Your corn land, will give you 100 bushels corn; your 6 acres of oats will yield 240 bushels of oats, and 2 acres of wheat will give 60 bushels of wheat. In truth, there is twice the certainty of this yield of small grain, to the one of corn. Will not the oats and wheat go doubly as far in feeding a farm as the corn; the former an enriching crop, the latter an impoverishing one. Whilst your fellows could plough over their five acres of corn once, they could cut and put away the small grain crop. All the labour, then, expended previously on the corn-crop is lost, and might have been employed on the cotton-crop. Let your carts in hauling it out scatter manure before the ploughs, which are following the sower, and immediately covering in the manure. I have mentioned 8 acres, for the purpose of preparing thus, the succeeding year, the cotton land. About January, list in all the stubble in one furrow. Upon this make the cotton bed; you will thus have your cotton land doubly manured, which must be alternated, until the lands can be reclaimed by sowing a surplus quantity of oats. A farmer by this arrangement may ultimately make seven or eight bales of cotton to the hand, having ample time to attend it well. The whole eight acres are not so much, but what it can every year be most highly manured. A much larger quantity of oats and wheat, however, can be sowed; and twice as much as could be gathered, without interfering with the cotton-crop, should be planted; it should be renewed for turning in stock, without cutting—a most efficient mode to reclaim land. With this preparation a planter can indulge in what is now termed the "expensive amusement" of rearing stock. The abundance of oats and straw thus procured, is sufficient to induce us to abandon our little "hardy and hard timed cattle," for the tender and to "be well fed English breed." This brings me to my third consideration.

Our object should be in this and every country, to keep only grazing hogs, such as will eat and live on grass. I know of but one breed, (the cobbed) with this propensity. They are a small thrifty hog—and their grazing disposition is not lost, by crossing with the Por-

tuguese hog, which also gives them size. In our climate rye will, throughout our severest winters, pasture hogs; and with a rye pasture, and subsequent oat fields. your hogs can be raised for the pen, when the potato and turnip, with the oat crop, can fatten them. The oat field planted not to be cut, should not be applied to the hogs, until used and scattered out by your colts and cattle.

One-third of the horse power on every plantation should be mares, to be let to studs or jacks. Mares foaling in the fall season are not at all prevented from working on the plantation. Mules will answer the purpose of the winter season, and in the commencement of ploughing time, the colts should be weaned, and the mares put to the plough.

Now for my fourth consideration, "that a planter should be a seller and not a buyer." Colts put on the rye lots and the oat fields, can be raised without one dollar expense; and it is down right extravagance for a planter to buy either horses, mules, cattle, pork, butter, or flour. A plantation thus arranged, secures all the facilities for affording the occurrence of such expenditures.

I have hastily summed up these considerations, they may not be clothed in the style becoming their importance: that they are worthy public attention, I am assured from the sanction of all with whom I have conversed since their occurrence.

Yours, respectfully,

J. B. D.

Cultivation of the Sweet Potato.

Mr. Editor,—Sir: I comply with your request, and accordingly proceed to answer your queries upon the "cultivation of the Sweet Potato." In doing so, I only give you my own practice. Doubtless, it may contain some errors; but being derived from experience of many years, I am inclined to recommend it, as generally correct.

I shall answer the queries in the order in which they present themselves.

Query.—What do you consider the best soil for the sweet potato?

Answer.—Both *roots* and *slips* do best on high sandy or yellow soil. *Slips*, however, will do well on moderately

low land, well drained; so as not to be injured by too much water. When planted on land of the latter description, I have generally found, that slips do not keep as well; nor are they as sweet and mealy as when planted on high lands. New land, if the leaves upon it be well rotted, will answer well for either roots or slips; care, however, should be taken to burn the undecayed leaves, on new land intended for roots. Unless this be observed, the excessive heat of the leaves undergoing fermentation, in the summer, will burn up the potatoes.

Query.—How do you prepare your land for sweet potatoes, and at what *time?*

Answer.—The system of preparing land for sweet potatoes, by moveable cow-pens, I consider the very best. It saves time in carting out manure—more equally imparts the manure to the soil, and yields a greater return than any other mode of potato cultivation I have ever practised. You should commence running your cow-pen, just early enough, to allow you time to go over your land, by the time you are prepared for planting. This being done, the land will be found hard and compact. Mark it off into lines, five feet apart, so as to give twenty-one beds to the task. Run two furrows with the dagon-plough, down each line, and you will thus render the soil loose and mellow; and you may, now, bed up, so as to finish by the 20th of March, at which time the seed should be sown, not more than six inches apart. The most expeditious mode of sowing seed, is to drill the top of the beds with the hoe, and haul the dirt over the seed with the cover-boards.

If you have neglected to run the cow-pen over the land, manure well with either of the manures I shall mention, and list or cover over immediately as spread out, and proceed to bedding as directed above.

Query.—What is the best kind of manure for sweet potatoes?

Answer.—I have said in my last answer, that I consider running the cow-pen over the land, the very best kind of manure. When this has not been done, compost, cotton-seed, rotted marsh or sedge, and mud, are excellent, when properly applied.

The great principle in applying these manures is, to cover them well, and give them proper time to rot in the land before planting.

Cotton-seed, applied in the proportion of 1 to 2 bushels to the bed, and covered over in time to vegetate, before planting, is good for either *slips* or *roots*.

Salt mud, and even fresh mud, containing vegetable matter, are equally good when applied in proportion of *one* or *two* loads to the bed or task row. When mud is used, if soft, it should be spread out, so as to leave no *lumps*, and when dry, it should be well pulverized or chopped up fine. The salt mud is best upon high and dry soil; but it also does well upon other soils as the maturer of the roots.

Rotted marsh or sedge, is also excellent when applied in proper quantities.

Oats, rye, or any other green crop ploughed or listed in, will act powerfully as manure upon potatoes. The stubble of oats, after the summer's gathering, has been tried with success.

Query.—How is the potato crop *worked* after planting?

Answer.—As soon as the potatoes are up, I proceed to take out all the *grass* and *weeds*, carefully picking the tops of the beds; so as not to disturb the roots of the young plants, by pulling them out. As soon the plants begin to put forth vines, the grass and weeds, (if there be any,) should be again picked, and the dirt should now be brought up to the plants. If this work is well done, there will be little necessity of any after working. The use of the hoe at this period, frequently does more injury than service.

Query.—What are the various kinds of sweet potatoes; which the most productive; and which keeps best?

Answer.—The various kinds of potatoes I have planted are the Yams or Spanish, Leather coats, Brimstone, with red and white skins, Reds with white hearts.

The *Yams* or *Spanish* potatoes, do well in land highly manured. They produce largely, but do not come very early. They are the best potatoes to keep.

The *Leather coats*, very much resemble the Yams; and differ from them only in size and flavour—being larger and more mealy. In other respects the same observations apply to these potatoes, as I have made upon *Yams*.

The *Brimstone* are an early potato, grow well in almost any soil; but do not keep as a provision crop.

The *Reds* with white hearts, I have always found the

earliest potato. They produce largely on any kind of soil —keep well, and as an early crop are generally preferred by the negroes.

In conclusion, I would particularly recommend the leather coat potato, as the most *delicate* and best *flavoured* potato for table use.

AN EDISTO PLANTER.

Ruta Baga.

St. Simons, March 10, 1836.

Mr. Editor,—Sir: For the last two years I have been attempting to introduce the culture of the turnip, particularly the ruta baga, *after corn is matured*. I am well satisfied, that a full crop of ruta baga may be made after corn, and the land annually improved.

A system of this kind would answer on all Sea-islands. I am sure one acre of ruta baga, will fatten from 4 to 6 steers. I have fattened 4 old steers this year; to each I gave 100 turnips, or 60 ruta baga, and one peck of boiled cotton-seed per day, with rice-straw. In two months their beef would not have disgraced your market, and I know of none having better beef. The manure they produce in fattening, will, I think, be more than sufficient for the same land next year. My greatest difficulty has been to get good seed, and to get it up in our droughts in August and September. I shall say much more on this subject if I live to experience another year.

I am, very respectfully, yours,

JOHN COUPER.

Surveys—Pisé Building.

Mr. Editor,—Having read, sometime since, an article in the Carolina Gazette, on "the propriety of surveying our various plantation lands;" also an article in the same paper on "the Pisé work," I herewith send you my remarks on the same.

As regards the surveying our plantation lands, and mapping plats of the same; I think legislation might effect it.

In the first place, considering the importance of the profession of surveyor, no one should be permitted, here-

after, to enter into it, without a previous examination at College, where, by the bye, a class should be formed for *exclusively* teaching Mathematics, Civil Engineering, and Surveying, in the Geological, Geographical and Typographical Department. This class should be furnished with a baggage wagon, a tent, and a complete set of instruments. As soon as formed, it should become ambulatory. Its first object should be the survey of the rivers, and next the trigonemetrical survey of the country. Possessed also of a principal Mineralogist and Botanist, the result of their examinations would be communicated to the pupils and the public. Large triangles should be laid down, and as soon as habit and application had created practical talents, these might be laid out in smaller ones, and, as in the hereditary dominions of the House of Hapsberg, each owner might eventually, have a lithographic map of his lands.

That House, by adopting the Geodesic System, equalized and adjusted its land tax; and the example of Joseph and his mother, Maria Theresa, have, I believe, been followed by every civilized government in the world, except the United States; and it is to be hoped, the enlargement of the Typographical Engineer Corps, will soon effect the desirable object. Every effort should be made to induce Congress to do so; but, at the same time, the professorship, to be attached to the South-Carolina College, should be established; and, perhaps, if twenty young men could be received from the drug-shop and the lawyers office, a class might soon be formed. The charge made by Messrs. Doterer and Detmould, for less than a month's work on the Columbia and Branchville road, amounting to $2,000, as well as Mr. Cruger's charge for the Savannah and Macon road, amounting to $5,000, surely affords encouragement to young men not otherwise lucratively employed. Their profit, after paying assistants to complete the first could have been little less than one-half or $1,000.

To the districts, where land is so low in price, the subject is very interesting; and, to those where there probably may be found marl for manure, the object of a survey, embracing mineralogy, &c. would be truly enlivening. The low country might possibly be drained and become as valuable as it is now valueless. In it, a Dutch engineer would, I have no doubt, do great things.

As to the Pisé, Mr. Herbemont, doubtless, from an ignorance of the fact, has omitted to state, that Dr. W. W. Anderson of Stateburg, 30 miles from Columbia, for 8 or 10 years, had been living in a house, containing 4 *Pisé* rooms.* This circumstance furnishes a proof of the miserable want of inter-communication among the various districts of the country. I believe the worthy Doctor first obtained a knowledge of it from the book of a Mr. Johnson of New-Brunswick, (N. J.) He pursued it with success, and never did any man furnish better rooms for either day or night, than are to be found in the Doctor's hospitable mansion. In hot nights, especially, they are very pleasant. Where the soil suits, the erection is very cheap. The great difficulty is, in making the multitude believe, that earthen walls can become consolidated without water; and, this is no small difficulty, as will be readily believed, when it is known, that, although Dr. Anderson's house has been built for many years, his example has not been followed.

Mr. Skinner, when Editor of the American Farmer, took great pains to introduce the system; but Gen. Cocke is the only individual of whom I have heard who thought it worth adoption—except, of course, Dr. Anderson and Mr. H., of whose "specimen" building I have now for the first time heard. The former has, I think, succeeded in a wall. G. L. C.

Camden, So. Ca, March, 1836.

* The following extract will show that the buildings of clay (Pise) were erected upward of 30 years ago, with complete success, by Bartholomew Carroll of this city.

"Within the last eighteen years (1808) more lofty, elegant, and spacious brick buildings, both public and private, have been built in Charleston, than in any preceeding thirty or forty years. Within the same period, Bartholomew Carroll introduced a new mode of building with clay. Several houses thus built in Charleston, have hitherto answered very well; and they are as elegant, comfortable, and as free from moisture and all other untoward accidents, as any brick houses, though they cost much less. They stood the Hurricane of 1804, which exceeded every thing of the kind which had taken place since the year 1752: yet the example has not been followed by a single citizen. Some doubts were at first entertained of the safety of building lofty spacious houses with these materials; but the experience of thirteen years proves that moderate sized clay houses, of two or three stories, may be safely tenanted for that length of time: for aught that it appears, they may be built as large and last as long as any other houses whatever. Wood in time yields to putrefaction, and may be destroyed by fire. Clay is incapable of the first, and instead of being destroyed by the latter, is only changed into brick."—*Dr. Ramsay's History, So. Ca.* Vol. ii. p. 254.

The Education and Treatment of Overseers.

It will not be denied, by planters, that the character of overseers is an object of primary importance. Nor do we think, it will take long to convince them, that the course of conduct usually towards that class of persons, is founded in an unwise and mistaken policy. The overseer has an important trust confided to him. His station, if he properly appreciate it, is full of responsibility. Upon his conduct depends, in no small degree, the reputation, as well as the interest of the planter. During the absence of the latter from his plantation, (which in the low country is no inconsiderable portion of the year) the overseer is to all practical purposes, his representative; and has the principal management of his affairs. But the good or ill success of the management, redounds more to the credit or discredit of the employer, than the employed. Are the negroes neglected or treated inhumanely; the blame and the odium are laid at the door, not of the agent, but of the principal. Is the crop deteriorated either in quantity or quality, through the incapacity or the culpable negligence of the overseer, it is the planter, and not the real delinquent, that suffers both in the weight of his purse, and the reputation of his fraud. How important, then, is it, that the understanding and relative connexion, subsisting between these two parties, should be such as to ensure on the side of the overseer, respectability, capacity and diligence.

Again;—the occupation of the overseer is solitary, painful, and often attended with great risk of health and life. He is compelled to estrange himself in a great measure from all the pleasures of social intercourse; and to encounter during the sickly season, all the perils and terrors of that pestilential scourge, which infests our low country, and which walking in darkness, is seen only in the fearful havoc it makes. Surely, then, some compensation not only in the way of pecuniary reward, but also of personal consideration and standing, is due to those who willingly venture and sacrifice so much.

Now in what light are overseers usually regarded? How are they generally treated? We are pained to answer, that in a great majority of cases, they are regarded by their employers merely as dependents; who are to be

kept at a distance—as hirelings, who are hardly worthy the wages of their daily labour. The planter looks down upon his overseer, as one of an inferior and degraded caste; and the latter, generally speaking, is but too apt to lose, in consequence, all feeling of self-regard for principle, and all sense of a community of interest with his employer. What is the natural consequence? Why, that the overseers, as a class, sink low in the scale of respectability, and that very few, other than the indigent, the idle and the ignorant can be brought to accept employment in that capacity. It cannot be otherwise; for respectable men will not, under the goadings of absolute want, offer themselves for service in a line of life, that is supposed to subject them to humiliation and disgrace.

Nothing can be clearer, than that the planter, is in the end, the principal sufferer by this state of things. It is generally in this way, that by a sort of retributive justice, the evil is made to recoil on the heads of its authors. It is some consolation, however, that the remedy for this mischief is obvious and easy; and with the disinterested view of bringing about a happier system of things, we venture to submit a few hints for the consideration of planters.

Overseers should be raised from the low station they now occupy, and brought nearer to a level with their employers. They should be regarded more as *friends* and *advisers*, than as *dependants* and *operatives*. They should be encouraged to extend their agricultural knowledge, and to regard planting rather as a science, regulated by systematic and well-settled principles, than as a mere experimental process. More dependant on chance, than an accurate calculation of the operations of natural and artificial causes. They should be invited to a frequent and familiar interchange of opinion with their employers; and this too, not merely by way of condescention, but with a becoming respect and deference for their advice, and with a view to elicit, and use in practice, whatever of knowledge or experience they may have acquired. They should be incited to steady and well-directed effort in the hope of ultimately acquiring an interest in the soil. To plant on shares with the employers should be held out as an inducement to correct conduct and the acquisition of useful knowledge. This is the case in all other pursuits and lines of life, and why should

not the practice be extended to planting. The clerk and the apprentice are in the habit of looking forward to the time, when they shall become, the one a mechanic, and the other a master-mechanic, on a footing of equality with their former employers; and find in the prospect of their rising to usefulness and wealth, a great stimulant to active exertion and praiseworthy deportment. Why should the overseer alone be deprived of the benefit of an incentive, which would work the double advantage of improving his own state and condition, and of increasing the security and the value of the property of those, whose interests would thus become, in a greater degree, identified with his own.

It would doubtless require, in the first instance, some sacrifice of pride and feeling on the part of the planters to carry this system fully into effect. But the ultimate advantage of such a chance can hardly be doubted. The instances in which this system has been tried, have shown the feasibility and value of it. If generally adopted, overseers would become, to a much greater extent, than they now are, a respectable, intelligent, and thriving class of of men. Young gentlemen of liberal education, but limited means, who now waste their health and time in hopeless indolence, would become willing to overlook estates, and gain in this way a competent and respectable livelihood. The planter would feel more confidence in the success of his operations, so far, at least, as they depended on his mere effort and skill. In a word, the character of the overseer would be improved and elevated; the comfort and morals of the slave better secured; and the interests of the planter, and of society in general, in every way advanced. We think we see signs of improvement in this respect; and we confidently hope, the day is not distant, when a radical and entire change shall have taken place in such an important branch of our domestic economy.

Queries on the Guinea Grass and Cotton Seed.

Mr. Editor,—I have of late been looking over some old volumes of the American Farmer, and by communications in 1821 and 1822, I see some of the South-Carolina planters were then experimenting on the Guinea grass. Could you give an account of their success in the Agriculturist?

Something upon this subject may have been published in the back volumes of the Agriculturist, but being a new subscriber, I have not seen it.

A machine for expressing oil from cotton-seed, has been established in Darien, and as there is a considerable demand for seed, perhaps, the following questions might adduce answers, which would be interesting to a portion of your subscribers.

What is the value of cotton-seed per bushel, as manure for corn or oats? Fifteen cents is offered for it for making oil.

In what quantities to the acre should it be applied?

Has it ever been known, under any circumstances, to prove injurious to corn or to oats?

Is it a fit manure for cotton?

Hoping the *Southern Agricalturist* may prove beneficial to the Southern Planters, and profitable to the editor.

I remain your obedient servant.

E. H. BACON.

Will some of our correspondents oblige us, by answering the queries of Mr. Bacon. Cotton-seed readily sells in the city at 25 cents per bushel, as food for cows. Is it more profitable for the planter to boil it for his cattle, or to use it as a manure for his cotton or corn?

As regards the Guinea-grass, of which Mr. Bacon inquires, information will be found among our selections. The article alluded to, has been already published among the original communications of a former volume of this journal: but as many of our present subscribers have not the volume in their possession, we hope we will be excused in presenting the article again.

PART II.

SELECTIONS.

The following is from the New-York *Cultivator*, and part of the system of *British Husbandry*, extracted from that Journal.

Lime.

Is applied to a great variety of uses: it is employed in medicine as an anti-acid; mortar is composed of it, when combined with sand; and it serves as a manure, which is the only view in which we now have to regard it. When used for the purposes of agriculture, it is formed by exposing the substances we have mentioned to certain degree of heat in the furnace, or kiln, of the lime burner. When this has been continued for a sufficient length of time, their weight becomes considerably diminished, though they contain their former shape and bulk; and either limestone or chalk, when thus reduced, is in most places known by the name either of *lime-shells*, or *shell-lime*, or simply *shells*. In this state it is called *quick-lime:* the materials of which it is thus composed possess hardly any active property, but when burned, then becomes caustic to the tongue, and effect the speedy decomposition of most vegetable and animal bodies. When applied in this form—either in the way of compost, or spread over the soil by itself—it is so far from affording nutriment to any thing that may be there growing, that, were its effects to be long continued, it would consume it. But if water be thrown upon it, a great degree of heat is in a short time generated; the burnt shells begin and burst asunder, and the mass gradually crumbles down or falls, as it is more commonly said, into a fine powder, which becomes white, of whatever colour it may have been before it was calcined. Or when it has been exposed for a short time to the influence of the atmosphere, it is also found to loose this caustic power, and it is thus reconverted into a substance of the same mild nature as that from which it was obtained—in all its properties exactly resembling chalk.

This operation is called *slacking*, or *slaking;* and lime, when deprived of its scorching quality, is termed *slaked-lime*, or, in the language of chemists, *effete*. Instead of watering it in heaps, the practice which generally prevails is to lay the shells upon a fallow, in small hillocks of about a bushel and a half each, either thrown up around the circumference of each heap, or covered up immediately with some fresh soil made very fine, which, when laid on moderately thick, should be clapped close down with the back of the spade, so as to exclude the admission of either air or rain. In this state it may remain for a few days, care being taken during that time to keep every part of the heaps tight and sound, when it will be found that the mois-

ture of the earth will have completely slaked it. Although it may be thought that this covering of lime is unnecessary, it yet has this use —that without it the rain would form crusts over the heaps, which would not only prevent the moisture from penetrating regularly through them, but would also hinder them from being pulverized without considerable difficulty. It will then be fit for use, and when spread over the field, it should be immediately ploughed in with a shallow furrow, and well stirred with the harrows in every direction. Upon an 18 feet ridge these heaps will be the same distance, or 6 yards asundar, from centre to centre, if about 200 bushels be laid on per acre; and so on when other quantities are applied. Instead of slaking the lime in this manner, it has, however, been recommended 'to lay it down in a long heap, or mound, on one side of the field on which it is to be applied. Two labourers are then employed to turn the mound, and a third waters it. When the whole has thus been gone over, it is allowed to lie for four or five days, after which it is agained turned, and if any part of the lime should be found to be still unslaked, more water is added.'

From this it will be perceived, that one chief cause which renders the burning of lime necessary, arises from the extreme difficulty of obtaining the powder without the process of grinding; but by being thus more finely divided, it can also be more evenly diffused over the soil, with which, therefore, it becomes more evenly mixed, and more prompt in its effects upon the land; and when laid upon it in its hot state, it not only occasions the destruction of weeds, but powerfully stimulates the action of manure.

One very strong reason for applying it instantly is, that, if spread immediately after being turned, and while yet in a powdery and caustic state, a smaller quantity may suffice to cover the whole surface of the ground, and to come into contact with more minute particles of the soil: whereas, if suffered to lie any length of time exposed to the atmosphere, it imbibes so much moisture, that it runs into clods, and can never again be so equally divided into small parts, wherefore a much larger quantity is required to produce the same immediate effect. It is in this state, also, that it acts the most powerfully upon all organic matter which may be already lying undecomposed within the soil —insects, the fibres and roots of obnoxious plants, and the seeds of weeds, which it dissolves and transforms into mould. It is also more efficacious than effete lime in its influence upon what is called *sour land*, though simple chalk, if applied in large quantities, will correct the evil. Neither is it improbable that, during its process of slaking, the heat which it generates by absorption of moisture causes it to swell in a manner which the tenacity of the soil cannot resist: thus producing fermentation, it not only eventually makes the land mellow, but renders matter which was comparatively inert, nutritive, and is probably more beneficial to land containing much woody fibre, or animal fibrous matter, than any calcareous substance in its natural state.* If, therefore, quick-lime really possesses superior qualities as a

* In its first effect, burnt lime decomposes animal matter, and seems to accelerate its progress to a capacity of affording nutriment to vegetables: gradually, however, the lime is neutralized by carbonic acid, and converted into a substance analagous to chalk; but in this case it more perfectly mixes with the other ingredients of the soil, and is more pervadingly diffused, more finely divided, than mere chalk, artificially applied.—*Sir Humphry Davy, Elem. of Agric. Chem. lec.* vii.

manure, it seems only fair to infer that, the greater the strength and vigour of such properties, the more assuredly will they effect its purpose when in that state, than after it has been rendered effete.

Considerable judgment is however requisite in this mode of its application; for, although it promotes putrefaction, and converts the pulp, or saponaceous substance, of vegetable matter into the food of plants, yet, if too great a portion of lime be added, it may have a contrary effect; and it always destroys, to a certain extent, the efficacy of animal manures, either by combining with certain of their elements, or by giving to them some new arrangement. It is necessary to the reduction of carrion, or for qualifying the noxious effluvia of night soil; but is so injurious, when mixed with any common dung, that it tends to render the extractive matter insoluble: thus, if a sufficient quantity of quick-lime be added to a heap of stable-dung in a state of fermentation, it will set it on fire, and the whole will be consumed. It should never, therefore, be mixed with farm yard manure, unless a small quantity be found absolutely necessary for the prompt destruction of seed-weeds, or the decomposition of roots; but when laid upon the land during the same season, the dung should be ploughed down alone, and the lime afterwards harrowed in with the seed-furrow.

By neutralizing the acids combined with the mould, this manure qualifies the vegetable and other soluble substances also present in it, and occasions the whole to be converted, by the influence of the atmosphere and of water, into nutriment for plants; but in poor soils, having less vegetable matter to convert into mucilage, it acts so powerfully as not only to exhaust such land by its final effects, but to be prejucial to the immediate crops.* We have, indeed, the opinion of a very experienced farmer, who is also well versed in chemistry, 'that, should much rain immediately succeed the ploughing, and any considerable portion of sand be either in the lime or in the soil, it is almost a moral certainty that such soil will be in a worse state than it was before the lime was put on, because, the moisture being retained by the lime and the soil, and the tenacity of the substratum not suffering the superabundance to pass quickly away, it causes the whole to run together, and form a compact and impervious bottom, which before, however, might have been pervious in a slow degree. That this must the case is evident from this consideration,—that quick-lime, mixed with a certain portion of sand, and duly moistened, contracts and forms a substance which we call mortar, or cement; in proportion, therefore, as the quality of these materials is more or less perfect, so does the substance become more or less compact, hard, solid, and impervious: such must be the condition of the soil; and it is but reasonable to suppose that a great part of the seed sown upon it must perish.

It may, indeed, be alleged, that the caustic action of quick-lime can never be exerted to any great extent, as it attracts fixed air too strongly not to become immediately slaked; but its effects are found to be powerful even in that short period. provided that it be promptly

* 'All the experiments yet made render it probable that the food of plants, a it is taken up from the soil, is imbibed by the extremities of the roots only. Hence, as the extremities of the roots contain no visible opening, we may conclude that the food which they imbibe must be in a state of solution at first; and, in fact, the carbonaceous matter in all active manures is in such a state of combination as to be soluble in water whenever a beneficial effect is obtained.'—*Dr. Thomas Thomson's Chemistry, 3d edit.* vol. v. p. 376.

and intimately mixed with the soil, for though the land should contain an abundance of vegetable matter, yet if it has been injudiciously cropped, or insufficiently manured, the lime will only add to its infertility.

When quick-lime has been deprived of its causticity, it is called by chemists *carbonate of lime*, and in that mild state it does not act upon animal or vegetable matter with the same violence as quick-lime, but instead of dissipating any portion of the substance which may be contained in the soil, it facilitates its reduction into that state by which it the most effectually assists vegetation. Neither has it the same tendency to combine, as it were, into a mortar with the sand of poor clays.

Lime, however, *whether quick or slaked*, when used by itself, without any addition of earth, is not possessed of any vegetable quality: thus, , seeds planted in a flower-pot filled with powdered carbonate of lime, regularly watered, vegetated feebly, made little progress, and died without coming to perfection; but when partly filled with garden-mould, and carbonate of lime 1½ inch thick over it, the plants put down their radicles straight through the lime, without ramifying or stretching sideways, till they arrived at the mould. Even in a mixture where lime was only one-fifth, the plants were poor and sickly, and made no progress; and when quick, it, with the aid of water, suddenly destroys all vegetable substances. It may even be hurtful to vegetation when laid in too large a quantity upon very light and warm soils, for, by quickening evaporation, it dries the land too much, by which means plants are deprived of the moisture necessary to their sustenance; therefore, it is that calcareous earths are frequently known by farmers as 'burning soils;' and, by its injudicious use or repetition, without the aid of animal or vegetable manure to supply the nourishment of which they have been deprived by crops, the growth of which has been thus forced, land, though of superior quality, may, at length, become exhausted. Thus experience teaches that lime, when applied to land, has different effects upon some soils than it has upon others: on many there is a rapid and permanent improvement, on others there is less benefit, and on some it is said rather to retard than to promote vegetation.

This is no doubt chiefly influenced by various unascertained properties in the soil, and partly also by difference in the qualities of the lime itself, arising from its mixture with other earths.

Whether it possesses any other properties, through the stimulating effects of light and heat upon the vegetable fibre, has been conjectured, but has not been supported by any positive fact, and seems to be contradicted by the slow effect of effete lime in its operation upon the soil. It is, however, worthy of remark, that calcareous earth is found in the ashes of all vegetables: that it is present in a larger proportion in wheat, clover, and some other plants whose growth is especially promoted by the use of calcareous manures, and many are said not to ripen in ground in which it is entirely wanting. We may, therefore, conclude, that it is of the highest importance in the process of vegetation, and that an accurate investigation of its mode of action, by enabling us to judge with more certainty of its powers, would greatly tend to the improvement of agriculture. It is indeed much to be regretted that the subject has not been more fully investigated, and that some more definite judgment has not been framed regarding the properties of lime, the effects of which in its application to the soil are

exposed to the most contradictory results. Much money has thus been uselessly expended and labour thrown away, which under better information, might have been saved; and without scientific analysis of the component parts both of soils and of lime, we remain much in the dark regarding their effects on vegetation, but, judging from the faint light with which we have been furnished, we shall still endeavour, by comparing science with practice, to obtain such instruction as may guide us to an economical and useful application of this manure to field culture.

Application of Lime.

Those purposes appears to be—first, to render whatever substances may be lodged in the soil, or matter which forms part of it, and which may be injurious to vegetation, either harmless or useful; and thus to prepare the soil for the reception and nourishment of seeds and plants: and secondly, to facilitate the decomposition of putrescible matter, so as to furnish food to vegetables during their growth. It has been proved by careful experiment. that the application of lime is the only known alterative which, upon poor, weak, and weeping clays, has power to heal the soil. With the assistance of water, it suddenly decomposes all animal and vegetable bodies, and when thus spread upon neglected ground covered with heath and moss, the old turf is decomposed, and a saponaceous matter is formed which sinks into the soil and covers it with sweet herbage. We also know that it imparts a certain degree of vigour to some peculiar plants—as, for instance, sainfoin, the roots of which penetrate far into the interstices of chalk, and grow luxuriantly, though only covered by a slight coat of inferior soil.

It is, however, an error,—though entertained by many farmers,—to suppose that lime in any state comprises fertilizing properties within itself; and that, without operating upon the soil, or upon the substances which it contains, it is an enriching manure. It does not possess any fertilizing principle in its own composition: it is merely a calcareous earth combined with fixed air, and holding a medium between sand and clay, which, in some measure, remedies the deficiencies of both. But though, when alone, unfavourable to the growth of plants, yet experience shows that it is an ingredient in soils which, whether naturally forming a component part of their substance, or judiciously mixed with them by the husbandman, adds greatly to their fertility, for it has the power of attracting much both from the earth and from the air, which occasions the decomposition of plants, and thus converting them into nutriment, it gives power as to vegetation which, without its operation, would otherwise lie dormant. It also appears to act with great force upon that substance which, being already converted by the decomposition of plants into a species of earth, we call *mould*.

The other causes with which we are acquainted regarding the operation of lime as a manure would lead to a chemical discussion, which could only prove uninteresting to the generality of our readers: we shall, there, confine ourselves to the following observations: There can be no doubt that it is a powerful stimulant when applied to deep loams and heavy clays, which contain mould of a nature so sour as to appear to unfit them for the purposes of vegetation; or to land which has been previously either more or less manured with animal or vege-

table substances, without any addition of lime or other calcareous matter, in which case it often produces effects far more fertilizing than the application of dung, for its active powers render every particle of the putrescent manure useful; but if the latter be not afterwards repeated at no great distance of time, the soil will, in the course of a few years, become considerably exhausted. In all arable land, however impoverished it may be, either by nature or bad management, there yet always exists some portion of mould, and, on this, a first dressing of lime occasions a sensible improvement of the soil, which soon becomes apparent in the increased product of the crops. A second dressing will also be attended with some apparently good effect; but unless that, and every succeeding repetition, be accompanied with ample additions of farm-yard manure, or other putrescent matter, to supply the loss thus occasioned by the exhaustion of the vegetative power, every future crop will be diminished. The land is then necessarily thrown out of cultivation, and left for a series of years to recover itself under pasture, which, in the course of time, may be effected according to its former condition; but in the interim it is rendered nearly fruitless. It is thus that many thousands of acres, in every part of the kingdom have been run to a state of almost total infertility; and it is even said, that the too great use of lime, though apparently judiciously employed by some of the first farmers in the Lothians, has been lately found very detrimental to their crops.

Marsh lands, however, which have been drained, will generally support a repeated and abundant application of lime, because they usually contain a large proportion of matter upon which the stimulating powers of lime are peculiarly adapted to act; and it will be found much better suited to the purpose than dung. On all rich, deep, dry, and loamy soils it may also be applied with effect; for although they contain within themselves the component parts of the best soils, yet they are frequently found to be sluggish and inert; and dung, whether through imperfect fermentation or owing to the want of calcareous matter, often remains dormant in the land until roused by moderate quantities of quick-lime, which, if applied at distant periods, will effectually operate to bring it into activity. It should, however, be turned into the ground some weeks before the dung, in order that it may become thoroughly slaked by mixture with the soil, or otherwise it would have the effect of abstracting some of its nutriment. Such soils, after the application of lime, produce much heavier crops with a much smaller proportion of dung than if no lime had been used, because the operation of the latter acting upon the dung renders every portion of it useful.

Clay land shows an evident disposition to combine with lime, and it bears the repetition of this species of amelioration better than lighter soils. When applied to heavy tillage land, either for the purpose of reducing its cohesive properties, or of supplying an additional quantity of calcareous matter, small dressings of lime will have but little effect, and if sand or calcareous earths are to be employed, it is recommended, by a practical farmer of known experience, as more economical to apply them separately than as a compost. It powerfully assists all adhesive soils; and when laid hot from the kiln upon deep clay, it has been known to occasion a very large increase in the former crops. It has also been often observed, in fallowing clayey soils, "that, in wet weather, when a dose of lime has been just given, the land continues more friable, and is less apt to bind up on

the recurrence of drought, than where it has been neglected. The grain growing on the well-limed ground preserves its healthy appearance in wet seasons, while that growing on land that has not been limed is yellow and sickly.

Upon *sandy soils*, which seldom abound much in vegetable matter, lime has a mechanical operation, which, by combining with the finer particles of the soil, gives consistence to the staple of the land, and attracting the moisture from the atmosphere, it imparts it so gradually as to be less liable to be hurt by drought in those parching seasons by which crops are injured. It is, therefore, said to be cooling to hot land; but if it be not also mixed with some portion of clay, with which it may combine, it then is apt to unite itself with the sand, with which it composes a kind of mortar, the effect of which has been already described, and which cannot be dissolved without much difficulty, and the plough often brings hard lumps to the surface of the soil which cannot be easily broken. Thus when such land has been frequently limed, nothing can restore it but the abundant and reiterated application of putrescent manure; the demonstration of which is perceptible throughout many parts of England, where, from possessing a chalky soil without strength to maintain a sufficiency of live stock to furnish dung, the land has in many places been worn out through the inconsiderate use of lime.

On the *exhaustion of land by the application of lime* there is, however, much difference of opinion. It is indeed evident, that the continuation of cropping, without an addition of nutritive manure, will ultimately exhaust the best soils; but though their natural fertility be thus aided, it yet cannot depend entirely on that support. This must be apparent if we reflect that land, without any addition of animal or vegetable substance, will still produce crops: for pure sand, clay, and chalk, though each in themselves separately barren, yet, when mixed together, exert chemical influences upon each other, which, by the attraction of the air, the dews, and the rain, the force of the sun, and the generative powers of growing vegetables, effect the production of corn and fruit. It is therefore clear that the land alone is capable of vegetation; but every day's experience proves, that the amount of its products, its fertility, in short, depends in a great degree upon the decomposition of the substances which have been previously converted into vegetable mould, or which are added to it by manure. Any thing whatever may be called manure which, when applied to the soil, either rectifies its mechanical defects, corrects any bad quality, and either stimulates it to yield, or stores it with nutriment. Thus, if lime be laid upon pure sand, although the latter would be rendered more tenacious, and would thereby become more favourable to the germination of vegetables, yet seeds could find no nourishment from either the lime or the sand, and putrescent manure would still be necessary to produce a crop. But if the soil consist of clay and sand, containing animal or vegetable matter in a torpid state of decay, then lime would be preferable to dung. The state of the soil should therefore be minutely inquired into before lime is employed, and it should be only used to give effect to the inert substances with which it may be combined.

By the analysis of soils, we find that all productive earth contains a certain portion of lime; and although we learn from experience that its stimulative powers upon the roots of plants are very great, yet we are but imperfectly acquainted with the extent or the exact manner in

which its influence is brought into action, and "we are in a great measure ignorant of the actual changes that are produced upon the earth after this manure has been applied." It would, however, seem, that, where it exhausts, it is only by hastening the putrefaction of the animal and vegetable matter in the soil, and by that means applying a larger portion of those substances in a given time than could be otherwise afforded to the growth of plants. It is thus known to produce more luxuriant crops, and it will also consequently enable the farmer to continue his land in tillage, during a certain time, with more effect than if no calcareous manure had been laid on; but, although it may not tend to the deterioration of the original staple of the soil, it can hardly be doubted that it must be thus more promptly deprived of its fertility than if the exhaustion of that vegetable mould with which it had been supplied by nutritive manure were occasioned by a more gradual process of decomposition.

That this is the only way in which effete lime can exhaust lands, seems probable from the large quantities of neutralized calcareous earth which are often applied without any bad effects in the form of chalk, shells, limestone-gravel, and the whole tribe of marls. A larger quantity of these is oftener laid on in one year than would be used of lime in half a century, were the land in tillage to be managed according to the custom of some countries; yet it is not generally impoverished, and, in many cases, it is permanently improved. This, however, is probably occasioned by its combination with other substances, which either counteract its exhausting powers or supply the waste of nutritive matter.

The employment of lime seems to be of the greatest service in the *breaking up of fresh or coarse land*, on which it acts more powerfully than on soil which has been long in cultivation, and indeed the most striking improvements have been effected by its means on moorlands and mountains; but it should be given for the first time abundantly. Such is the usual effect of lime upon arable: upon *grass land* it is laid in smaller quantities; and in this top-dressing, perhaps the preferable mode is to apply it in a compost with earth; except when the soil consists of clay. When thus spread upon the surface, its action upon the sward is productive of the most palpable improvement, and continues perceptible during a long period. No other manure will create so rapid a change: for it is such an excellent corrector of acidity, that it tends to produce the sweetest herbage where only the most unpalatable pasture was formerly to be found. This, indeed, is so apparent, that if a handful of lime be thrown upon a turf of rank, sour grass, which has in former years been invariably refused by cattle, they will afterwards eat it close down. Now, animal dung, when dropped upon coarse benty sward, produces little or no improvement until limed, it then, however, not only augments the crops, but the finer grasses continue in possession of the soil, and the land is thus doubly benefited: for the dung dropped by the stock on which it is pastured, is both increased in quantity, and improved in quality.*

* In Derbyshire the farmers have found that, by spreading lime in considerable quantities upon the surface of their heathy moors, after a few times the heath disappears, and the whole surface becomes covered with a fine pile of grass, consisting of white clover and the other valuable sorts of pasture-grasses.—*Anderson's Essays*, 4th edit. vol. i. p. 527. *Survey of Derby*, vol. ii. p. 437; and *Westmoreland*, p. 335.

Farmers should never consider lime as the food or nourishment of plants, but as an alterative of the soil; never to be used but when nature requires it, either to dissolve noxious combinations, and to form new ones; to bind loose soils, or to diminish excessive cohesion; and to reduce the inactive vegetable fibre into a fertile mould. For such purposes there is not, perhaps, a more valuable article in the whole catalogue of agricultural remedies; but some farmers, who do not reflect upon the subject, when they perceive that lime has once excited the dormant powers of the soil into action, and that good crops succeed for a few years, are apt to draw from thence very false conclusions, and continue liming and tilling without the assistance of putrescent manure, until their land at length is rendered incapable of the production of corn. It has indeed been pertinently observed by a good judge of such matters, "that there is an analogy between the treatment suitable to the animal and vegetable creation. When medicines have removed the cause of their application, they are discontinued, and the patient, rendered weaker by the application, requires some invigorating aliment: in like manner, some time after an effectual liming, the soluble carbon of the rotten dung, or some such restorative, should be applied to the soil to replenish it with what it may have been robbed of by the action of the lime."

In fine, lime should always precede putrescent manures when breaking up old leys for cultivation, for, if the land contains acids, or noxious matter that is poisonous to plants, they will be decomposed and rendered fit for vegetation; and hence, the superiority of lime to dung on new lands. But calcareous and putrescent manures operate very differently: "the former, being more stimulant and corrective, help the farmer to an abundant crop at the expense of the soil alone; while the latter furnish the land at once with fertilizing fluids, and will insure a good crop on a place perfectly barren before, and after the application of lime."

Much uncertainty prevails among farmers *regarding the state of lime*; some contending that it should only be applied when hot and powdered, and that when it has been slaked, its effect is comparatively trifling; others maintain the contrary. But these disputants consist chiefly of men whose experience has either been confined to one kind of soil, or who have only used it under particular circumstances, and as they only condemn the system of others because their own has turned out successful, or the reverse, it is not improbable that, in the view they take of the subject, each may be in the right. It will, therefore probably be found, that in all cases where the land is constitutionally disposed to receive benefit from a calcareous dressing, that is to say, when it has not been previously limed, or when it has been long laid down and refreshed by grass, or enriched by the application of dung, it is of little importance whether the operation take place when the lime is quick or effete. Upon waste lands, however, its causticity has an evident and necessary effect: for the undecayed vegetables, which abound in all soils in a state of nature, should be speedily decomposed, and it should therefore be spread hot from the kiln. In point of economy, too, there can be no doubt but that it is most thriftily used when laid upon the land in the latter state: for the labour is less; and a smaller quantity will serve the immediate purpose. It is, however, obvious, that the choice of circumstances and

season is not always in the farmer's power: and that necessity often obliges him to lay it on when completely effete. It has been said, indeed, upon high authority, that caustic lime exhausts the land; but repeated trials have shown that its ultimate effects are equally beneficial in the one state or the other, though there is a more immediate advantage in the employment of quick-lime by the destruction of weeds. A common method is to leave it spread during some months upon clover or sainfoin, not intended to be broken up until the following year,—a plan which is advisedly with regard to marl, which partakes of some of the qualities of lime, and is the better if allowed to remain during a season exposed to the atmosphere; but the stimulating properties of quick-lime will be thereby lost, as it will be converted into mere chalk. Opinions are also much divided respecting its effects when laid upon pasture land which is intended to be kept in grass. There is, indeed, no question that, in either state, if applied in moderate quantities to a dry soil, or to land that has been completely drained, such a top-dressing will have the most beneficial effect upon the herbage: but it must be admitted, that when laid on quick, it requires more circumspection in its application, and should not be employed in the same quantity as when effete.

On the Diary Husbandry of Holland.

[FROM THE CULTIVATOR.]

THE Highland Society of Scotland, considering the advantages that might be derived from an acquaintance with the modes of managing dairies in Holland, offered, in 1831, a premium for the best report upon that subject, founded on personal observation. The premium was subsequently awarded to John Mitchell, whose report was published in 1833. We abstract from this report such facts as are likely most to interest our dairy farmers, and lead to their improvement. We will barely premise, that the products of the Dutch dairy, particularly the butter, are in higher demand than those of any other country. Vast quantities of butter are annually exported to Britain, the West-Indies, &c. 116,233 cwt. of butter, and 167,913 cwt. of cheese, were brought from Holland to England in 1830. Were the same care taken in manufacturing our butter which is bestowed in Holland, we should find a brisk foreign demand for all our surplus stock. But at present our butter is inferior, will not bear transportation to a warm climate, and will not compete with that of Holland

Pasture.—The pastures in Holland have been reclaimed from the ocean. They are flat, low and moist, the water in the small canals always rising nearly to their surface. They are of course permanent, or are seldom broken with the plough. They are top dressed every third year with cow-house manure mixed with the scrapings of the small canals, and the first year after dressing, reserved, generally, for hay.

Supposing the whole growth 700, the Dutch farmers consider that there grows, for the consumption of the cow, from the beginning of spring till May, 135 parts; in June, 20; July, 135; August, 95; Sept. 55; October till winter, 80.

Cows are particularly selected for the dairy. Their price is about 9 or 10 *l.* sterl.—40 to 45 dolls. They are generally fattened and turned off to the butcher at 8 years old, and bulls at 4 or 5. The cows

are turned to pasture in March or April, and are at first covered with a very thick cloth of tow, covering the upper half of the body from the shoulders to the tail, to prevent diseases from cold. They are pastured about 30 weeks. Hay is their common food in winter, though rape cake and brewers' grain are sometimes added. The byres of cow-houses are generally lofty, airy, paved with large square brick, and kept perfectly clean. The roof is about 10 feet high. There are no racks or mangers, but the food is placed in gutters, always, clean, near their heads. Gutters in their rear serve to carry off the urine and dung, and these gutters are also kept clean.

Process of Manufacture.—The cows are always milked by the men, and the butter and cheese made by the women, generally of the family. Ninety cows are managed by nine men, and two women. There is generally one man required to ten cows; while two women are considered enough for any dairy. The farmer reckons that he can make 100 guilders, about 40 dollars, per annum, by each cow.

Butter.—There are three distinct kinds of butter made in Holland: *Grass butter*, made when the cows are at grass; *Whey butter*, from the whey of sweet milk cheese; and *Hay butter*, made in winter.

Grass Butter.—The cows being carefully milked to the last drop, the pitchers containing the milk, are put into the *Koelbak*, a description of which will be found in the preceding article. When the cream has been gathered and is soured, and if there is a sufficient quantity from the number of cows, they churn every 24 hours, the churn being half filled with the soured cream. A little *boiled* warm water is added in winter, to give the whole the proper degree of heat, and in very warm weather, the milk is first cooled in the *Koelbak* or cooler. In small dairies, the milk is sometimes churned, when soured, without separating the cream. The butter immediately after being taken out of the churn, is put into a shallow tub, called a *vloot*, and carefully washed with pure cold water. It is then worked with a slight sprinkling of fine salt, whether for immediate use or the barrel. When the cows have been three weeks at grass, the butter is delicious, is made in fanciful shapes of lambs, stuck with the flowers of the polyanthus, pyramids, &c., and sells as high as 44 stivers, 60 to 70 cents, the 17oz. or Dutch pound. If intended for barreling, the butter is worked up twice or thrice a day, with soft fine salt, for three days, in a flat tub, there being about two pounds of the salt allowed for fourteen pounds of butter; the butter is then hard packed by thin layers into casks, which casks are previously carefully seasoned and cleaned. They are always of oak, well smoothed inside. Before being used, they are allowed to stand three or four days, filled with sour whey, and thereafter carefully washed out and dried. Each cow, after being some time at grass yields about one Dutch pound (17½oz.) butter per day.

We beg our dairy women to mark two points in the preceding process. 1. *No salt is used but what is incorporated with and dissolved in the butter, and which is necessary to give it flavour*; and 2d, *the butter* intended for keeping *is worked from six to ten times*, to incorporate the salt, and *to separate from it every particle of liquid*, which, if left in it, would induce rancidity.

Hay Butter undergoes a like process.

Whey Butter.—The whey is allowed to stand three days or a week, after being separated from the curd, when the cream is skimmed off, or the whey itself put into the churn, and the butter is formed in

about an hour. By this process, in winter one pound of butter is obtained from each cow in a week, and in summer 1½ pounds. The relative prices are generally, grass butter 8½ stivers, hay butter 7, and whey butter, 6.

Cheese.—There are four kinds of staple cheese made in Holland—the *Edam* and *Gauda*, both made from unskimmed milk; and two kinds, called *Kanter Cheese*, made from milk once and twice skimmed.

Edam Cheese.—The process of manufacture of the Edam cheese is as follows:—The milk being yearned as soon as taken from the cow, when coagulated, the hand, or a wooden bowl, is passed gently two or three times through the curds, which are then allowed to stand a few minutes; the bowl or finger is again passed through them, and they stand a few minutes. The whey is then taken off with the wooden bowl, and the curd is then put into a wooden form, (of the proper size and shape of the cheese to be made.) This form is cut out of the solid wood by a turner, and has one hole in the bottom. If the cheese is of the small size, (about 4lbs.) it remains in this form about ten or twelve days, if the large sized, it remains about fourteen days. It is turned daily, the upper part during this time being kept sprinkled with about two ounces of purified salt of the large crystals. It is then removed into a second box or form of the same size, with four holes in the bottom, and put under a press of about 50lbs. weight, where it remains from two to three hours, if the small size, and from four to six if the large size. It is then taken out, and put on a dry airy shelf in the cheese apartment, and daily turned for about four weeks, when they are generally fit to be taken to market.

Alkmaar, in North Holland, is the great market for Edam cheese. It is not uncommon, to see 800 farmers at the market, and 470,000 cheeses for sale on one day. The price there averages about 30*s.* per cwt. ($6,66.)—*N. Y. Cultivator.*

Gauda Cheese.—This kind of cheese is also made from the milk immediately on its being taken from the cow. After gradually taking off the principal part of the whey, a little warm water is put upon the curd, which is left standing for a quarter of an hour. By increasing the heat and quantity of water, the cheese is made harder and more durable. All the whey and water is then taken off, and the curd is gradually packed hard into a form cut out by the turner, flatter and broader than the form for the Edam cheese. A wooden cover is placed over it, and the press, with a weight of about 8lbs. put upon it. It is here frequently turned, and altogether remains under the press about twenty four hours. The cheese is then carried to a cool cellar, put into a tub containing pickle, the liquid covering the lower half of it. The water for the pickle is boiled, and about three or four handfuls of salt melted in about thirty imperial pints of water. The cheese is not put in until the water is quite cold. After remaining twenty-four hours, or at most, two days, in the pickle tub, where it is turned every six hours, the cheese, after being rubbed over with salt, is placed upon a board slightly hollowed, having a small channel in the centre, to conduct the whey which runs off into a tub placed at one end. This board is called the *Zouttank*, upon which several cheeses are placed at a time. About two or three ounces of the chrystalized salt is placed upon the upper side of the cheese, which is frequently turned, the side uppermost being always sprinkled with salt. It remains on the zouttank about eight or ten days, according to the warmness of the

weather; the cheese is then washed with hot water, rubbed dry and laid upon planks, and turned daily, until perfectly dry and hard.

The cheese house is generally shut during the day, but must be open in the evening and early in the morning.

Gouda is the principal market for this kind of cheese, where it sells at about 35*s*. per cwt.

Each cow at grass in Holland is calculated to give about three or four pounds sweet milk cheese per day.

We omit the method of making the *Kanter Cheese*, which is similar to our skim-milk cheese; and the cheese utensils.

The milk houses are generally between the dwelling and cow-house, in a square apartment, in a corner of which is the cooler; it is airy, roomy, and paved with square bricks; the upper part serving for churning, making cheese, &c. and descending a few steps, into a sort of cellar, is the milk room, having two to four windows, which are opened or shut according to circumstances.

The cheese houses are also generally cellars, kept clean and well ventilated.

The Dutch are remarkably particular as to the quantity and quality of their salt, of which there are three kinds manufactured; and it is this, our reporter thinks, which is the principal cause of the sweet and delicious flavour of their butter, which, although well flavoured, hardly tastes of salt, or rather of that acrid quality which is perceptible in the butter of Great-Britain.

Cleanliness governs in all the Dutch dairies. Every dwelling-house is a model and a pattern. They seem to vie with each other on this point. The cow house is pure and clean, not a particle of filth being to be seen in it; the cows, says Mr. M., are as clean as if they were in a dining room; the milk and cheese houses, and in short every part of the house, are free from dust and dirt of any kind. The whole apartments, even the byre (stalls) and hay house, are generally under one roof; and the cleanly system, and the admirable arrangement, give that comfort and pleasure which are too often wanted in other countries.

Cut and Uncut Potatoes for Planting.

[FROM THE NEW-ENGLAND FARMER.]

Mr. Fessenden,—The following details of an experiment to ascertain the relative advantage of planting cut or uncut potatoes is at your service for publication if you think it of sufficient importance.

I planted this year alternate rows of cut and uncut potatoes. I put four pieces into each hill of the cut potatoes, and two potatoes into each hill of the whole potatoes. The hills were three feet apart, each way, and of course the number of hills in an acre was 4840. The produce of the rows planted with cut potatoes, was at the rate of three hundred and thirty-five bushels to the acre, or twenty-three thousand five hundred and twenty pounds. The produce of the rows planted with whole potatoes, was at the rate of four hundred and fifty-eight bushels, or thirty-two thousand and sixty pounds. The difference in the crop in favour of whole potatoes was at the rate of one hundred and twenty-two bushels to the acre, but as there were twenty-two bushels more of seed to the acre used in planting the whole potatoes, the nett gain was only one hundred bushels. However, as

one bushel of potatoes at the season of planting is usually worth two bushels at harvest time, it will be more accurate to calculate the gain at seventy-eight bushels. The kind of potatoes planted was the "*white blue nose*," which is decidedly the best potato for the table I have ever cultivated, though a moderate bearer unless it receive generous treatment.

Silk Culture.

We feel fully convinced that the cultivation of Silk, will in the course of a very few years, become a considerable item among the exported articles of this State. Our climate is, perhaps, better suited to the health of the worm than any other portion of the United States; and our soil peculiarly adapted to the successful growth of the mulberry tree. In the middle districts of this State, our lands being generally too poor for the cultivation of cotton and corn, our citizens have no object upon which they can apply their labour with profit to themselves. Even where our lands are more fertile, our wives and daughters, have few, if any sources of employment. They cannot go into the field and work, and at home there is nothing upon which they can profitably expend their labour. The silk culture, is just the one to supply the deficiency of which we complain. Our females may carry it on without the least exposure; and as a return for their labour, they will secure independence—indeed, wealth for themselves and families. As evidence of this, let them read the extracts subjoined. They are collected, without regard to order, from our exchange papers of the last month.—*Editor.*

Incorporating Silk Companies.—It is gratifying to witness the readiness with which all of the State Legislatures grant acts of incorporation to enable companies to engage in the culture and manufacture of silk. Even in States where the people look upon incorporations with a jealous eye, and have unequivocally expressed an opinion unfavourable to their multiplication for ordinary manufacturing purposes, they unhesitatingly incorporate silk companies with large capitals, ample powers and liberal privileges. We could cite several cases in proof of this remark; but one or two must suffice. The Legislature of New-Jersey, now in session, has incorporated "the New-Jersey Silk Manufacturing Company," with a capital not to exceed $300,000. We have received a copy of the charter, and think it a liberal one, though susceptible of improvement in a few particulars.

The Legislature of New-York has also incorporated "The Troy Silk Company," with a large capital and all powers necessary to a successful prosecution both of the culture and manufacture of silk. On taking the vote on its passage in the Senate, there was no dissenting voice—it passed unanimously. This is as it should be—it is liberal and enlightened legislation, and we hope the same spirit and intelligence will be manifested by every legislature to whom application may be made for incorporations for the same object. There are many petitions before the legislatures of Ohio and Massachusetts for acts of incorporation for silk companies, some of which we understand

have been already granted, particularly in the former State; but we have nothing definite as yet in relation to them.

Silk Companies in New-Jersey.—The editor of a New-Jersey paper, after examining a pair of beautiful silk gloves, knit from silk raised by a lady, thus exults in the prospect of a general introduction of the culture of silk in the United States. "While inspecting the articles, which we almost envied the possessor, we well-nigh fancied that soon we should be surrounded by groves and orchards of the mulberry, and large cocooneries and silk manufactories in our own vicinity, and our wives and daughters seated at the wheel and spindle, as their honest matrons were wont to do in days of yore; and when on the Sabbath and holiday oacasions, they appeared in the halls of worship or at the convivial fireside, instead of being shrouded in fabrics of foreign produce, we should see them habited in garments, the result of their own industry and perseverance."

The editor of the Belvidore Apollo, publishes the following extract of a letter, by which it will be seen that the feelings of the people of New-Jersey are prompting them to action in this laudable enterprise, the writer says. "It may be gratifying to many to learn that an application from enterprising citizens of this country, is now before the legislature of this State for an incorporation of a company to cultivate and manufacture silk in all its various branches, under the name of *The New-Jersey Silk Manufacturing Company*, which there is no doubt will be granted. When this company commence operations, a market will be opened at home for *all cocoons*, which our farmer's wives and daughters may raise."

Several gentlemen of Elizabethtown have also petitioned the legisture for the incorporation of a company for the culture and manufacture of silk, with a capital of $100,000, with the privilege of increasing the same to $150,000. The petition has been referred to a Select Committee, who have reported a bill to incorporate a company for the aforesaid purposes, under the name of the "Elizabethtown Silk Manufacturing Company." It has been ordered a second reading.

Price of Making Cocoons.—In most of our estimates of the profit of a mulberry plantation, we have put down the labour of making silk at three-fourths of its value, and in no instance less than one-half. A few days since, a silk grower from Mansfield informed us that he was ready to contract for making cocoons at $1 a bushel, which is one-third of the price they are now selling at the silk factory in this city. He remarked that he could furnish the help and make a fair profit at that price. From this statement it will be seen, that foliage sufficient to make a bushel of cocoons is worth on the tree $2,00, and according to the quantity ordinarily consumed in making a bushel, is 1½ cents a pound. Taking this as a basis of a calculation, a farmer may readily ascertain the income he may derive from this source without interfering with his other agricultural operations. The sale of mulberry foliage is a very important article of traffic in Europe and Asia, and we have no doubt will soon be in America. Every farmer who sets out mulberry trees will very soon derive a fair profit from them, though he may not be disposed to engage in the culture of silk. We hope no farmer will neglect to provide in this manner, a fund from which both himself and his posterity may draw at pleasure.

Atlantic Silk Company.—A number of the citizens of Nantucket have recently associated for the purpose of engaging in the manufac-

ture of silk, with ulterior reference to the production of the raw material. They have assumed the name of the "Atlantic Silk Company," and propose investing a capital of not exceeding $40,000. From an article on the subject in the Inquirer, it is manifest they have taken hold of the business with an energy and zeal which will ensure success. They have purchased a site for a factory, and are about erecting a building 60 by 30 feet. They have also contracted for an engine, machinery, &c., and expect to turn out in the course of the ensuing year upwards of three hundred yards of rich heavy fabrics per week.

Beaver Silk Company.—The silk business is "going ahead" in Pennsylvania. A company has lately been formed in Philadelphia, by the name of "The Beaver Silk Culture and Manufacturing Company." The capital stock of the Company is $50,000, and a tract of land near Beaver Falls in Western Pennsylvania has been purchased for their operations. Samuel C. Atkinson, Esq., editor of the Saturday Evening Post, has been elected President of the Company. —*Silk Culturist.*

Native Silk.—A specimen of sewing silk was shewn to us a few days since by a gentleman of this town, which was produced on the farm of Mr. Adams, of Walpole, Cheshire County, and manufactured by Mrs. Adams. It was reeled from the cocoons on a common hand reel and spun on a common spinning wheel. Mrs. Adams was aided in the process by no other knowledge than that which she had acquired from reading. For smoothness, evenness of texture and strength, it is not surpassed by any which we have ever examined. We have a sample of the silk in our possession, which we shall be glad to exhibit to any one who may have the curiosity to inspect it.

We are further informed, that the trees from which the worms are fed, are but four years from the seed.—*N. H. Argus.*

The Manufacture of Silk.—We have heretofore had occasion to speak of the success with which the power loom had been applied by Mr. Gay to the weaving of Silk. But the only experiments which had then been made, had been made upon an old and very awkwardly constructed cotton loom. Within the last three weeks, one of the new looms, with improvements by Mr. Gay, adapted to the manufacture of silk has been put in operation upon a piece of fine white Pongee Handkerchiefs, three quarters wide. This loom has put at rest all doubt that might before have been entertained in relation to the practicability of weaving silk in this manner. We have several times made the observation by marking the piece with a pencil, and the loom has woven an *inch and a half* of this fabric in *one minute.* Other have at different times witnessed the operation of the loom, and their observation of the result has been precisely the same. The speed is regulated at *one hundred and forty* strokes of the lathe per minute, and the fabric which it turns off, is in no manner inferior to the imported article.

The girl who attends it is an experienced cotton weaver, and one of the smartest in the country. She affirms that she can without difficulty tend four of them, and turn off *one hundred* yards of goods per day.—*Pror. Jour.*

Have you made up your mind with regard to entering into the mulberry culture? If you have not, let no consideration deter you from it longer than the coming spring. A few dollars laid out in white mulberry seed, and *morus multicaulis* cuttings, if this should be judi-

ciously cultivated, would lay the foundation of future independence. We wish the farmer in moderate circumstances to bear in mind that a *single acre* in mulberries, will clothe and educate his children; that five will enable him to live sumptuously, and lay by enough in ten years to leave his family independent.—*Far. and Gar.*

From the Report of the Hon. Mr. Knight, of the United States Senate.—Perhaps but few productions of the manufacturing industry of the world are destined to be a greater source of wealth than that of silk. At the present time, it may be said to be a manufacture but little known and understood in the United States, and yet much is in an incipient and progressive state. A spirit of industry and enterprise is apparent in various parts of the country, and that industry and enterprise had been drawn towards the culture of silk, and we are led to believe, from specimens already produced, that ere long we shall rival some of the nations of Europe in the production of the raw material, if not in its manufacture. A number of companies are already formed, with capitals from $40,000 to $200,000, and are rapidly progressing in the growth and manufacture of silk; besides, hundreds (if not thousands) of individuals have commenced planting mulberry-trees, with the intention of making the culture and manufacture of silk a permanent business in their own families, and with their own hands; many have advanced so far in the business as to manufacture considerable quantities of sewing silk, and others have progressed farther, and wove it into cloth; and it is the opinion of many well informed, that it will soon be second to but one of the great productions of the country.

In a treatise on the nature and operation of a silk factory, by Dr. Ure, published the last year, it is stated the amount of silk manufactured in France was estimated at 140,000,000 of francs per annum, equal to about $28,000,000; and, that among all the employments of capital, none is so productive as the mulberry tree, yielding, as it does, from 15 to 20 per cent. to the agriculturist per annum.

One of the great obstacles to the establishment of silk culture seems now to be overcome by the invention of new machinery, by our ingenious countryman, Gamaliel Gay. By the invention of these machines, and the adaptation of the power-loom to the weaving of silk, the principal impediments to its manufacture are completely removed. It needs only the fostering care of the government, and the attention and industry of our citizens, to ensure the permanent establishment of one of the most valuable productions of the world.

The culture of silk is not necessarily limited to a part or portion of our country; on the contrary, it may be extended over the whole Union. The cold climate and comparatively sterile soil of the North and East are, in some measure, adapted to it, as well as the richer soil and more genial clime of the South and West; but it is believed that the Middle and Atlantic Southern States are peculiarly adapted by climate, soil, and labour, to the growth and culture of silk. The coloured population of that district of country who are too old or too young to participate in the labours of the field, can perform all the labour necessary to the perfection of the cocoon, after the trees have been planted. The mulberry grows luxuriantly in most all parts of the United States, and, in three or four years from the seed, will afford an abundance of foliage that may be gathered as food for the worms. It is said, in the neighbourhood of Turin, the seed is sown annually, and the leaves gathered the same season; but the economy of this process in this country, may be well doubted.

The Virginia Corn and Cob Crusher and Grinder.

[FROM THE FARMER AND GARDENER]

We were called upon a few days since by the inventor of the above machine, Mr. James C. Balwin, of Virginia, to witness its operation, and so far as we could form an opinion from a single performance, we were gratified with it. It very readily converted the corn and cob into a substance nearly as fine as bran. The cob so completely crushed with the common mass as to present very few angular particles, and we are compelled to say that we think the machine worthy of the attention of agriculturists generally. It would appear a work of supererogation to dwell upon the advantages to result from the conversion of the cob into a substance which will prove not only etable but digestible. and particularly as there have been mills for this purpose in existence for many years, and more or less approved of by farmers and planters of distinction. A thing so obvious in itself, it would seem ought not to require argument to enforce it; but such is the force of habit, and such the indomitable tendency of prejudice, that even at this day the utility of feeding the cob in this form is but partially known and less adopted, and upon many estates the cobs of corn are only used as food for the cow when other provender is scarce and difficult to be procured. Of its nutritive properties no one who has ever tasted it, while eating the corn off it as roasting ears, will entertain the least doubt; for its sweet and highly sugary flavour must have convinced him that it not only contains the principle of nutrition, but possesses it in an eminent degree; but it may be said that the sugary taste is not always the test of the alimentary properties of a substance as it is often met with in bodies decidedly poisonous; this is most true; but we affirm without the fear of contradiction, that where we find it in a body known to be perfectly innoxious, as is the corn cob, we have a right to conclude that it does contain nutrition. The question then, which we have to determine is, which is the best method of feeding with the cob? The answer is at hand :—that in which it is easiest digested in the stomach of the animal. But speculation aside: let us resort to the results of experiments, these being the safest guides in a matter of this kind.

P. Minor, Esquire, in a very interesting paper addressed to Gen. Cocke, Vice-President of the Agricultural Society of Albermarle, gives the result of a minute experiment made to test the relative nutritive strength of the cob and the corn by distillation, it was, says Mr. Minor, carried on under the eye of an experienced and intelligent distiller, and was as follows:—He took ten bushels of the corn and cob, weighing 367lbs., and ten bushels of pure corn-meal, which weighed 400lbs. They were both brewed or mashed on the same same day and distilled separately, with great care and accuracy. The *product* of the pure corn was 18 gallons, and *that* of the mixture, of corn and cob, was 13 gallons of spirits, each of the same degree of proof. "Now," observes Mr. Minor, "it is generally agreed that the cob constitutes about one-half of the bulk of corn; in other words, we give two measures in the ears for one shelled, and the cobs are either used as fuel or thrown away as of no value." If this were true, the product of the mixture then, should have been only 9 gallons, which is the half of what the pure corn produced. But 13 were obtained, four of which must have been, of course, extracted from

the cobs; or if we estimate its nutritive power by the quantity of spirit, it is clear, that whenever we shell ten bushels of corn, and throw away the cobs, we throw away a portion of food, equal to the difference between 9 and 13, or nearly one-half.

As it relates to the respective weight of each, the difference in favour of the mixture is still greater, the pure meal being more than three pounds heavier in the bushel; and I am inclined to think that the product of the mixture, would have been greater, if the experiment had been made earlier in the year, before the cobs had lost much of their substance by evaporation. This experiment was not made till the month of March. The distiller mentioned an important fact that occurred in the process. He found that the fermentation of the mixture took place much sooner, and was perfected a day or two earlier than the other. His *expression* was, that it mashed much easier, and better than any thing he had tried before, and which he accounted for by supposing that the particles of the cob being lighter and coarser than those of the grain, but mixed together, prevented too close and heavy a deposition of the mass at the bottom of his brewing tub.

"We are," says our authority, "aware that the saccharine particles, or those yielding spirits, are not the only constituents of nourishment. We know that oily and mucilaginous particles are also components and necessary parts of food. But which preponderates, or in what proportion to each other they are required to exist, in order to constitute a healthy food I do not pretend to know. It is certain, however, that the two latter do exist, in some degree, in the cobs of corn; and since the experience of all who have tried, concur in reporting it to be the most *healthy* mode of feeding corn, perhaps it will not be unfair to infer, that they maintain a due and proper proportion to the spirit. If so the experiment must be satisfactory, and the conclusion I have drawn from it undeniable."

"But besides the actual economy, there is another advantage in this way of feeding corn, which ought to engage the attention of every farmer. It is notoriously true, that the unground grain of corn is heating to the stomach of all animals and of difficult digestion, producing cholic, and other inflammatory disorders, particularly in horses, which tend greatly to shorten their lives. They are deprived of the benefits derived from the stimulus of distension, (so necessary to the proper health of animals,) by being unable to eat a sufficient bulk to produce it before they become gorged. But when ground into meal, along with the cobs, and mixed with cut hay or straw of any kind, this necessary distension is produced, without any danger of disorders arising from eating too much. It is now eight years since I have been in the habit of feeding corn in this way, and out of six to ten horses, which I have annually kept in that time, there has been but one case of sickness among them, which was a slight cholic. Indeed, since I have lived in this country, which is now eleven years, there has been but one death among that description of stock on my plantation, and that occurred to a mare with a young foal, in a distant cloverfield, without having been fed for many weeks, and which took place two or three days before it was known; this uncommon health of my horses, I attribute in a great degree to the use of ground food."

Mr. Minor's observation that "we are aware that the saccharine particles or those yielding spirits, are not the only constituents of nourishment" of the cobs and corn, is true, and he might have de-

monstrated its truth by a fact familiar to almost every one in the vicinity of distilleries and breweries, where the slop and grains are daily fed to both cows and swine with decided advantage to the quantity of milk and increase of fat of the animals respectively.

Mr. *Robert White*, of Shrewsbury, New-Jersey, in a letter to Judge Buel, remarks:

"A pretty extensive feeder for the Philadelphia market once told me, that a bushel of meal made of corn and cobs was quite equal to a bushel of meal made of corn and oats, that his cattle throve as fast on the former, and that they never stalled (cloyed) on it."

Mackenzie, an eminent Scotch authority, in speaking of ground food asserts that it is nearly a saving of one-half to feed grain in that form.

Judge Buel, in commenting on the subject, observes:

"We have abundant testimony, in the practice of eminent farmers, of the utility of feeding cob-meal to animals always mixed, we believe, with meal of corn or oats. Cob and corn-meal is improved by scalding, still more for hogs; and by boiling, with potatoes, apples and pumkins, and yet more by a partial fermentation. All these preparations facilitate digestion. An animal high fed with raw grain, whether horse, hog or ox, voids much of its food in an undigested state, which is of course lost for all beneficial purposes. Grinding grain for animal food, therefore, is universally admitted to be economical, and cooking and partially fermenting it, it is no less true, further enhances its value for swine. Even the water in which it is cooked augments its nutritious properties, in consequence, probably, of some chemical change effected by the boiling operation. Fish subsists in pure water, as is strikingly illustrated in the management of the gold fish. In giving cob-meal to horses and neat cattle that are fed with cut hay or straw, there is an undoubted advantage, at least so it is stated by those who are well experienced in feeding the grain and hay together. The grain, especially corn, is sometimes too heating to horses, and this tendency is counteracted by the stimulus of distension, afforded by the hay and straw. Mixed feed of this sort may be fed thrice in 24 hours. It is eaten in so short a time as to afford much beneficial rest to the animal. We would call the reader's attention to the facts stated in Mr. White's postscript."

The Rev. *H. Colman*, of Massachusetts, who is a practical and scientific farmer, in giving his experiments in fattening swine, states this important fact, illustrative not only of the superiority of ground food for that animal, but of boiling it.

"At first," says this nice observer, "we employed half a bushel of Indian meal to make a kettle full of hasty pudding; but we soon found that a peck of meal by taking up all the water it could be made to absorb, in a thorough boiling, would make the same kettle full (holding five pails) of sufficient consistency."

We could multiply authorities out of number, but it is useless, those which we have given are sufficient to show how essential it is for the farmers to husband their corn cobs, and what an immense saving it would prove to them to convert them into meal, to be used with their grain. Every one who will give to this subject the proper attention, will perceive that with the aid of one of these Corn Crushers, he might sell at least forty-five per cent. mere corn and keep his stock in fully as good condition as he now does. Indeed, we are of opinion that cattle and horses upon the same quantity of food would get fat in one-third

less time than they now do. But so far as our judgment goes, we are of opinion that the business of the careful farmer is only half performed, when he reduces his grain and cobs to meal; if he wishes to carry out his economy, he should either steam or boil his food, and mix it with cut straw, hay, fodder or corn stalks.

We had forgotten to mention that we had seen some oats broken in the same mill, which we think were greatly improved by the process. We understand one of our most experienced tavern-keepers, is of opinion, that by breaking the oats, fully 33⅓ per cent. is gained by the operation. If so, this machine will subserve another valuable purpose.

We will mention an important fact connected with the crusher:—from the facility with which it can be worked by *hand-power*, its value is greatly enhanced to many farmers who cannot meet the expense of motive-machinery—that by hand power it is competent to crush from four to six bushels of cobs and corn in an hour. This must be of vast importance to that description of farmers whom we have named, nor will it be less so to the gentleman of more ample means, for economy, liberal and enlightened economy, is equally as commendable in the rich as in the poor, but to those who would desire to apply horse-power to it, we would remark, that its capacity can be thus increased to from 15 to 20 bushels an hour.

Guinea-Grass, (Holcus polygamum.)

[FROM THE SOUTHERN AGRICULTURIST, FOR OCT. 1834.]

This has for many years been considered as one of the most productive grasses in the world. It is, however, we think, less so than the Gama-grass or the Egyptian Millet, still it is, in many respects, one of our most valuable grasses, and were it perennial with us as it is in the West Indies, it would probably be preferred to all others; but the roots of the Guinea-grass are in our climate almost invariably destroyed every winter, and it becomes with us an annual. The seeds are collected and preserved with such difficulty, that persons who have cultivated the Guinea-grass, have found it necessary to suffer a small portion of it to produce seeds, which, when ripe, were suffered to fall to the ground, and the spot was dug up in the fall and sometimes covered over with straw to shelter the seeds from the frosts of winter. From these nursery beds a sufficient number of plants were produced in the spring, for the limited wants of the individual, and we do not recollect ever having seen more than a half acre of land cultivated at one time on any plantation with this valuable and very productive grass. The plants should be transplanted a foot apart in rows, which may be about two feet asunder, they require one or two slight hoeings.

Architecture.

[FROM THE NEW-YORK FARMER.]

Without entering deeply into the subject of Architecture, we propose to devote a portion of our succeeding pages to the explanation of the general and fundamental principles upon which this highly interesting and beautiful science depends.

The science of Architecture has at all times, and in all civilized countries, been considered not only a pleasing but a highly useful branch of knowledge.

The great utility of this science, and the elegant accomplishments connected with its study, have almost rendered a knowledge of its rules and principles necessary to complete a liberal education. But it is not our intention to bestow encomiums on the science, nor to give anything like a detailed history of it, but to present our readers with a plain and condensed account of what may be termed its elementary principles.

Architecture is usually divided, with respect to its objects, into three branches, *civil*, military, and naval.

Civil Architecture, called also absolutely, and by way of eminence, *Architecture*, is the art of contriving and executing commodious buildings for the uses of civil life; as houses, temples, theatres, halls, bridges, colleges, porticoes, &c.

Architecture is scarcely inferior to any of the arts in point of antiquity. Nature and necessity taught the first inhabitants of the earth to build themselves huts, tents. and cottages; from which, in course of time, they gradually advanced to more regular and stately habitations, with variety of ornaments, proportions, &c. To what a pitch of magnificence the Tyrians and Egyptians carried *Architecture*, before it came to the Greeks, may be learned from Isaiah xxiii. 8. and from Vitruvius's account of the Egyptian Decii, their pyramids, obelisks, &c.

Yet, in the common account, *Architecture* should be almost wholly of Grecian original, three of the regular orders or manners of buildings are denominated from them, viz. *Corinthian*, *Ionic*, and *Doric*: and there is scarcely a single member, or moulding, but comes to us with a Greek name.

Be this as it may, it is certain the Romans, from whom we derive it, borrowed what they had, entirely from the Greeks; nor do they seem, till then, to have had any other notion of the grandeur and beauty of buildings, besides what arises from their magnitude, strength, &c. Thus far they were unacquainted with any other beside the *Tuscan*.

Under Augustus, *Architecture* arrived at its glory: Tiberius neglected it, as well as the other polite arts. Nero, amongst a heap of horrible vices, still retained an uncommon passion for building; but luxury and dissoluteness had a greater share in it than true magnificence. Apollodorus excelled in *Architecture*, under the emperor Trajan, by which he merited the favor of that prince; and it was he who raised the famous Trajan column, existing to this day.

After this, Architecture began to dwindle again; and though the care and magnificence of Alexander Severus supported it for some time, yet it fell with the western empire, and sunk into a corruption, from whence it was not recovered for the space of twelve centuries.

The ravages of the Visigoths, in the fifth century, destroyed all the most beautiful monuments of antiquity; and Architecture thenceforward became so coarse and artless, that their professed architects understood nothing at all of just designing, wherein its whole beauty consists; and hence a new manner of building took its rise, which is called the *Gothic*.

Charlemagne did his utmost to restore *Architecture*, and the French applied themselves to it with success, under the encouragement of H. Capet: his son Robert succeeded him in this design, till by degrees the

modern *Architecture* was run into as great an excess of delicacy, as the Gothic had before done into massiveness. To these may be added the Arabesk and Morisk or Moorish *Architecture*, which were much of a piece with the Gothic, only brought in from the south by the Moors and Saracens, as the former was from the north by the Goths and Vandals.

The architects of the 13th, 14th, and 15th centuries, who had some knowledge of sculpture, seemed to make perfection consist altogether in the delicacy and multitude of ornaments, which they bestowed on their buildings with a world of care and solicitude, though frequently without judgment or taste.

In the two last centuries the architects of Italy and France were wholly bent upon retrieving the primitive simplicity and beauty of ancient Architecture; in which they did not fail of success: insomuch, that our churches, palaces, &c., are now wholly built after the antique. *Civil Architecture* may be distinguished, with regard to the several periods or states of it, into the antique, ancient, gothic, modern, &c. Another division of *Civil Architecture* arises from the different proportions which the different kinds of buildings rendered necessary, that we might have some suitable for every purpose, according to the bulk, strength, delicacy, richness, or simplicity required.

Hence arose five orders, all invented by the ancients at different times, and on different occasions, viz. Tuscan, Doric, Ionic, Corinthian, and Composite. The Gothic Architecture may also be mentioned here, for it is perfectly distinct both from the Grecian and Roman style, although derived from the latter.

School Statistics.

[FROM THE FAMILY LYCEUM.]

About one-third of the population of a country are between the ages of three and sixteen or eighteen; and of course are the proper subjects of school education.

In the United States more than four millions of children ought to be under the influence of schools.

In Maine, the law requires that the inhabitants of every town pay annually for the support of schools, a sum equal, at least, to 40 cents for every person living in it. That amounts to about $120,000. Their expenditures are more than $140,000.

In New Hampshire, a separate tax of $90,000 is raised for schools, besides an annual appropriation from a tax on bank stock of $9,000 or $10,000.

In Vermont more than $50,000 are raised for schools, from a three per cent. tax on the grand list, and as much more from district taxes, besides an income of nearly $1,000 from banks.

In Massachusetts are nearly three thousand schools, supported by public taxes and private subscriptions. In Boston, the schools contain more than $12,000 children, at an expense of about $200,000.

In Rhode Island are about 700 schools, supported by a legislative appropriation of $10,000 annually, by taxes and by private subscriptions.

The Connecticut school fund is nearly two millions, but fails of its desired object. Children in the state, 85,000; schools about 1,500.

In New-York are more than 9,000 schools, and over 500,000 chil-

dren taught in them. School fund, $1,700,000, distributed annually, $100,000, but on the condition that each town raise by tax, or otherwise, as much as they receive from the fund. A wise provision.

New-Jersey has a fund of $245,000, and an annual income of $22,000.

In Pennsylvania, during the last year, more than 250,000 children, out of 400,000, were destitute of school instruction.

Delaware has a school fund of $70,000.

Maryland has a school fund of $75,000, and an income for schools from the banks, which is divided between the several counties.

Virginia has a fund of $1,233,000, the income divided among the counties according to the white population, and appropriated to paying the tuition of poor children, generally, attending private schools.

North-Carolina has a fund of $70,000, designed for common schools.

South-Carolina appropriates $30,000 annually to free schools.

Georgia has a fund of $500,000, and more than 700 common schools.

Alabama, and most all the western and south-western states, are divided into townships, six miles square, and each township into sections one mile square, with one section, the sixteenth, appropriated to education.

Mississippi has a fund of $280,000, but it is not available till it amounts to $500,000.

The Legislature of Louisiana grants to each parish, or county, in that state, $2 62½ for each voter, the amount for any other parish not to exceed $1,350, nor to fall short of $800.—$40,000 are applied to educate the poor.

Tennessee has a school fund of about half a million, but complaints are made that it is not well applied.

Kentucky had a fund of $140,000, but a portion of it has been lost. A report to the Legislature, from the Rev. B. O. Peers, says, that not more than one-third of the children between the ages of four and fifteen attend school.

In Ohio, a system of free schools similar to that of New England, is established by law.

In Indiana, Illinois, and Missouri, no legislative measures for the support of schools have been adopted. All the schools are supported by private tuition.

Treatment of Young Turkeys.

The principal remedy necessary in the first instance appears to be a stimulant, to counteract the extreme feebleness which attends young turkeys, more than other fowls, in the earliest stages of their existence: hence, a grain of pepper, &c., is usually administered as soon as hatched. But instinct, their infallible guide, it appears, has more successfully directed them to the wild onion, which is proved to be a powerful restorative to their natures, and in fact a grand panacea to the race. When they are permitted to ramble, you will see them busily cropping the green blades of the onion, with much apparent enjoyment.

Small homony made wet, with the addition of a portion of the wild onion chopped fine, or any other onion tops that can be procured, affords the best and most wholesome food they can have for several

weeks at least, or so long as they are confined to small enclosures.

Last spring, I witnessed with astonishment the wonderful efficacy of this article of food on a large flock of Turkeys, which had been daily and rapidly diminishing during the long rainy season in May. The mortality ceased the first day after their change of food to the above mixture of homony and onions: and in two or three days their rapid growth and improvement was visible to every eye.

Turkeys are very fond of green food of any kind, particularly lettuce and cabbage, and by the time they have grown off pretty well on the onions, there is plenty of that sort of provision. Cabbage leaves chopped and prepared in the following manner, may then be given them twice a day with good effect, morning and evening.

After the leaves are chopped, put them in tubs of water, to remain all night, and early in the morning spread the meal on boards before them: in the same way prepare that for the evening, by times in the morning. Continue also to feed them on homony, so long as they may require your care, and I venture to say that the good housewife, without uncommon accidents, will have no reason to complain of the want of a good dish, whilst turkey is in season.

With my best wishes for the prosperity of your valuable exertions in behalf of the general welfare, I remain yours, respectfully,

HASSINA.

On the means of prolonging the Duration of Valuable Varieties of Fruits; by THOMAS A. KNIGHT Esq.

[FOM THE LONDON GARDENER'S MAGAZINE.]

Mr. Knight believes that all the constitutional properties of every variety of fruit are contemporaneously inherent in all the plants which can be made from the buds of that variety, if taken as they usually are from the branches, be the mode of multiplying the buds of these branches into plants what it may. No trees of any variety can be made to produce blossoms or fruit, till the original tree of that variety has attained its age of puberty; and under our ordinary modes of propagation by grafts and buds, all [the individual plants of any given variety, as we understand it] become subject, within no very distant period, to the debilities and diseases of old age. It is therefore desirable that the planter should know at what periods of their existence varieties of fruits are most productive and eligible; and by what means (if any exist) the deterioration of valuable varieties may be prevented or retarded. Mr. Knight has been accustomed to consider 'that each variety possessed its greatest value in its middle age,' but now believes, 'that in vegetable as in animal life, the most prolific period is that which immediately succeeds the age of puberty.' Out of a good many experiments which led Mr. Knight to this conclusion were these:—From seedling pear trees twenty years of age, and which had borne their first fruit in the preceding autumn, he, in July, 1828, took from the extremity of their leading branches, buds, and inserted them into seedling pear stocks, then only four months old. Many of these budded plants, although not transplanted, nor subjected to any peculiar mode of treatment, produced blossoms abundantly vigorous in the spring of 1831, and consequently are but three years from the date

of their springing from the ground. Mr. Knight remarks:—'I never previously saw, and I do not think that any other person has seen, in this climate, fruit produced by pear trees at so early an age. I had previously made the same experiment with apple trees, with the same results.' Mr. Knight laid some branches of a plum tree, which had not attained the age of puberty, which (as he expected) freely emitted roots; but he found, contrary to his expectation, that the young shoots which these layers had produced, afforded, in the following spring, much blossom. The variety of plum experimented on, Mr. Knight believes to be one exceedingly productive of blossoms: 'but,' he adds 'I doubt much if such blossoms would have appeared, if the variety had been a century old.' Thus, while Mr. Knight hence infers that grafts or seeds taken from the bearing branches of very young seedling trees afford trees capable of bearing freely at a very early age, and, in consequence of their usefulness, likely to continue to grow with health and vigour; yet he readily admits that his information will not subserve the object of prolonging the duration of existing varieties of fruits in every part of seedling trees in the same degree affected by age. This, however, Mr. Knight states is not the case; for 'the decay of the powers of life in the roots of seedling trees is exceedingly slow, comparatively with [the decay of the powers of life in] the bearing branches. Scions [shoots] obtained from the roots of pear trees of two hundred years, afford grafts which grow with great vigour, and which, in many cases, are covered with thorns, like young seedling stock; whilst other grafts, taken at the same time from the extremities of the branches of such trees, present a totally different character, and a very slow and unhealthy growth. I do not, however, conceive that any scion [shoot] which thus springs from the root of an old tree possesses all the powers of a young seedling tree; but it certainly possesses no inconsiderable portion of such powers; and I have proved such scions to be capable of affording healthy trees of considerable size.

'If grafts or buds were taken from such scions [shoots] on the first emission, [from the roots,] much time would elapse before any blossom would be produced; but, if buds were not taken from such scions [shoots] till the branches attained the age of puberty, no loss of time whatever would subsequently occur.

'The branches of the plum tree, in the experiment above mentioned, emitted roots just at the period when they had attained the age of puberty; and I do not doubt but that scions [shoots] from the roots of these will spring from the soil, in full possession of all the powers attached to the branches from which they derived their existence. My own experience leads me to think that trees of the pear, the apple, and the plumb may be better raised by layers and cuttings of the roots than by the methods usually practised, and at a less expense.'

Mr. Knight remarks, in conclusion, that the permanent preservation of valuable and new varieties of fruits, of which the society's garden contains many, in their pristine and present state of health and vigour, appears to be an object of great importance; as does the retardation of the decay of many varieties, 'such as the Cornish gilliflower apple, which, in my estimation is, and always was, without a rival in the climate of England.'

Sour Soil.—Agricultural Science.

[FROM THE FARMERS' JOURNAL.]

Mr. Editor: I will mention an incident, by way of exhibiting the importance, to the farmer, of an acquaintance with the general principles of philosophy and chemistry. I am a farmer of the old school, and have more land than learning, and more faith in economy than skill in invention. I have a large piece of meadow, level and handsome, which might be supposed capable of producing three tons to the acre, and yet is so cold and *sour* as we call it, that I hardly get one ton. I have manured it in the most lavish manner; but to very little purpose. It was too wet to produce any other crop, even potatoes; consequently there would be little use in breaking it up, and seeding down anew. So I concluded to look upon my meadow as I would upon a cow with two teats, and be contented with my ton to the acre. My eldest boy is what they call a scholar, so I sent him to college. The second year he came home in the spring, and heard me speak of my *sour* meadow. He examined it, and asked why I did not spread upon it a quantity of lime or plaster, "and thus, by a chemical process, expel the acidity?" "Go to college with your jargon!" said I: but the boy talked till I, for the first time in my life, resolved to try an experiment. And I tried it in this way: As soon as the grass began to start, I set apart about an acre of the poorest for the "chemical process." Spreading thinly upon it a quantity of plaster of paris, I waited to mark the result. The benefits derived from the *process* were soon too obvious not to be discovered. The grass looked fresh and thrifty, and could soon be distinguished from the rest of the field. When cut, it was not only of a better quality, but nearly a third more in amount, than the produce of any other acre in the whole field. I tried the same experiment on the remainder, with the addition of a liberal and judicious application of manure, and the result was the same as with the acre. The boy solved the mystery by saying that an acid and an alkali, when mingled together, produced a fermentation in which both were neutralized, and which was favorable to the decomposition of such animal and vegetable substances as were not readily reduced by the common course of nature. The case was a simple one—but it struck me as rather singular that my boy could *study* agriculture in *college*, to better advantage than I had *on the farm*. I thereupon concluded that farming could profitably be made a *study*, and that chemistry and philosophy are two of its first and most essential branches.

Surface Manuring.

[FROM THE FARMERS' REGISTER.]

Until very lately, the opinion was very general, if not universal, that fermented manures should be turned under with the plough as soon as put on the land; and that otherwise their value would be much impaired, if not totally lost by evaporation. This was thought especially necessary, if the manure used was rough or half rotted.

I have thought much on this subject, and for the last twenty years marked the effects of manure in all its various modes of application, both on my own farm and on my neighbours'—and now propose to

give you the results of my observation, leaving it to persons more learned than myself to reconcile these results to the principles of philosophy. Fifteen or twenty years ago, I observed an old man of good practical sense, and successful as a farmer, carting manure out in the month of July, on a field intended for indian corn the next year: this was spread as fast as carted, and remained in that situation until the spring following. He justified this practice by a perfectly unanswerable reason, viz. that continued experience had taught him, that both his crop and his land were more improved by the use of his manure in that way, than any other he had tried. The confidence I had in the integrity and good sense of this old gentleman induced me to make repeated experiments on this subject, all of which have been decidedly favorable to top dressing, or surface manuring, and proved to my entire satisfaction, "that manure, when in contact with the earth, does not lose its strength by evaporation." This, I was exceedingly loth to believe, and I made many efforts to account for the fact—(for that I could not doubt)—and at length came to the conclusion that the chemical affinity between the particles of manure and the earth was too strong to be overcome by the power of evaporation; and that the apparent evaporation is nothing more than the passing off of the water, which had been contained in the manure. Whether this is so or not, I am sure I do not know. But I *do* know, that in the many different experiments I have made, both the land and the crop are more benefited by the application of manure *on* the land, than by turning it *under* the land. I hope young farmers, who are not yet wedded to any set of opinions, will be induced (at least) to make the experiment.

Not having fame as a farmer, to give weight to my opinions, I shall sign myself ARATOR.

Note.—The late Mr. Thomas West, brother of Sir Benjamin West, settled on a farm in New-Jersey, after he had reached the age of forty. His object was to make it a grazing farm. He used no plough whatever, but the hoe and scythe to eradicate briars, weeds, &c. He top-dressed his fields, or some of them, every year, and in a few years, he had the richest farm in the whole country around. See Memoirs Philadelphia Agricultural Society.

Method of obtaining Cream from Milk.

[FROM THE REPOSITORY OF PATENT INVENTIONS.]

A process of divesting milk of its component portion of cream, to an extent hitherto unattainable, has been effected by Mr. George Carter, of Nottingham Lodge, and is thus detailed by that gentleman, in a paper presented to the Society of Arts:—A peculiar process of extracting cream from milk, by which a superior richness is produced in the cream, has long been known and practised in Devonshire; this produce of the dairies of that country being well known to every one by the name of "cotted," or "clouted cream." As there is no peculiarity in the milk from which this fluid is extracted, it has been frequently a matter of surprise, that the process has not been adopted in other parts of the kingdom. A four-sided vessel is formed of zinc plates, twelve inches long, eight inches wide, and six inches deep, with a false bottom, at one half the depth. The only communication with the lower compartment is by the lip, through which it may be filled or emptied. Having first placed at the bottom of the upper compart

ment, a plate of perforated zinc, the area of which is equal to that of the false bottom, a gallon (or any given quantity) of milk is poured (immediateiy when drawn from the cow) into it, and must remain there, at rest, for twelve hours; an equal quantity of boiling water must then be poured into the lower compartment, through the lip; it is then permitted to stand twelve hours more, (i. e. twenty-four hours altogether,) when the cream will be found perfect, and of such consistence that the whole may be lifted off by the finger and thumb. It is, however, more effectually removed, by gently raising the plate of perforated zinc, from the bottom, by the ringed handles, by which means, the whole of the cream is lifted off in a sheet, without remixing any of it with the milk below. With this apparatus I have instituted a series of experiments; and as a mean of twelve successive ones, I obtained the following results—four gallons of milk treated as above, produced, in twenty-four hours, four and a half pints of clotted cream, which, after churning only fifteen minutes, gave forty ounces of butter—four gallons of milk, treated in the common mode, in earthenware pans, and standing forty-eight hours, produced four pints of cream which, after churning ninety minutes, gave thirty-six ouuces of butter. The increase in the quantity of cream, therefore, is twelve and a half per cent. The experimental farmer will instantly perceive the advantages accruing from its adoption, and probably his attention to the subject may produce greater results. I shall feel richly rewarded if, by exciting an interest on the subject, I can produce any, the slightest improvement in the quantity or mode of producing an article, which may properly be deemed one of the necessaries of life.

Engrafting and setting out Trees in the same season.

[FROM THE MAINE FARMER.]

Mr. Holmes,—In the 6th number of vol. ii, there is an editorial article headed as above, by which it appears you have put queries to a number of persons in regard to this mode of managing trees, without obtaining the information desired. It appears, however, that you have obtained through the medium of the Northern Farmer, the knowledge of one instance of its success. Two witnesses are better than one, I will, therefore, give you my experience on the subject in the spring of 1830. I bought thirty trees of a sufficient size to set in an orchard. In digging up the thirty large ones, we dug up a considerable number of small crooked things that were not worth any thing to the owner; I therefore obtained about sixty from the nursery. They were of all sizes, from the bigness of a pipe-stem to that of a man's thumb. I carried them home and put them in the barn. The next day being rainy, I went to work and grafted them. As soon as it was fair weather, I had them set in rows, each kind by itself. The result was, that upwards of fifty grew and did well. The large ones were set out and I engrafted them, some the same day, and some a few days after, and they did as well as any scions that I ever set.

Let trees be properly set, and I would then graft and warrant them as cheap as I would any trees whatever.

Z. SARGENT.

Gardiner, March 2, 1834.

PART III.

MISCELLANEOUS INTELLIGENCE.

Man has 246; the head and face, 63, the trunk, 39, the arms, 64, and the lower extremities, 60 bones. There are in man 201 muscles or pairs of muscles.

A Big Pot.—A potter, in Austria, by the name of Ignatius Carlier, finding it difficult to procure employment, though not from any want of skill in his art, resolved to do something which should bring him into public notice. He resolved, therefore, to make a pot which should astonish all beholders; and after labouring three months, he produced a vessel capable of containing 4000 measures, or a quantity of soup sufficient for 12,000 men. The sides were ornamented with garlands, the imperial eagle, and a representation of the temptation of Adam and Eve. This stupenduous pot being exhibited, procured him the requisite noteriety, and orders from all quarters poured in upon him in such profusion that he is now in a fair way to make his fortune.

If a similar encouragement would warrant our doing so, we would make our journal just six times its present size; and, moreover, present our patrons, with a full length likeness of every subscriber, who neglects to pay up his arrears in due time.

Mr. Clay has recently imported for his farm at Ashland, (Ky.) 8 or 10 of the finest cattle that have been seen in that state.

Conduct like this, is the true American System, at which Mr. Clay should aim. It will ensure him a reputation more enduring and profitable, than any thing he has yet done, in the whole course of his distinguished career.—*Editor.*

The Copper Mines of Flemmington, (N. J.) are, it is said, productive, and the operations of the miners successful. These are the only Copper Mines in the United States, that have paid for working.

Frosted Feet.—Cotton is applied to the feet when they have been injured by frost. Bees'-wax and lamp-oil melted together, and spread on a cotton or linen rag, and thus applied to the frosted parts, make a cure.

India Rubber Fabric.—A discovery has been recently made by Mr. Charles Goodyear, by which India Rubber, after having been dissolved, can be restored by a cheap process, to its original whiteness, and the pure gum formed into a fabric to be used instead of cloth, leather, or parchment, and can be moulded into almost any form, and can also be combined in a variety of ways with cloth, cordage or leather. Being first made white, it admits of every shade of colour worked in, and is as durable as the rubber itself.

A Bargain.—John Jacob Astor recently sold the Great Hotel in Broadway, to his son, William B. Astor, for *one dollar* and delivered the title deeds on New Year's day. If John Jacob has any more such bargains on hand, we'll take one them.—*N. Y. Herald.*

Dairy Secret.—Have ready two pans in boiling water, and on the milk's coming to the dairy, take the hot pans out of the water, put the milk into one of them, and cover it with the other. This will occasion great augmentation in the thickness and quality of the cream.

A Radish.—The Olentaugy, (Ohio) Gazette states, that a radish was brought to that office, by Capt. C. Plum, of Berkshire, which excels any other instance of extraordinary vegetable production on record. It measures two and a half feet circumference, two feet in length, and weighed twenty-one pounds!—*Al. D. Ad.*

A Cock-fight has been determined upon between the New-York and Philadelphia sportsmen. The Herald says that three purses have been made up for the occasion; two of 10,000 and one of 30,000. *O tempora! O mores!*

Soft Water.—There is a great complaint that the rain water cisterns almost throughout the city are empty, and some families are obliged to melt snow; some even use hard water, and others buy aqueduct water at considerable expense with which to meet the weekly demands of washing day, and the daily calls for other purposes. Our cistern has been empty several weeks; but we have neither bought nor borrowed soft water, and yet our washing never better done. We take the hard water from our our well, and into one bucket we put one ounce of the *carbonate of Soda*, which dissolves immediately when the water is warmed, and it becomes at once as soft and harmless as the purest rain water. This article is for sale at any of the apothecaries or druggists, and cost 12 cents per per pound.—*Boston Mer. Journal.*

Transplanting Onions is a practice of but recent introduction; a custom, we believe, borrowed from the Portuguese. By this means very large onions are obtained The bulbs to be transplanted are sown late in the spring, on a shady and rather dry spot, and very thickly together. Here the plants starve each other, and produce very small bulbs, which when done growing, are taken up, cleansed and stored to be replanted in the spring. By this management, the nature of the plant is so far changed, that instead of biennial it become a triennial; in the first summer it passes its youth, in the second arrives at full bulk, and the third produces seed: a full size bulb is necessary, it seems, to ripen seed in perfection.

Silk Manufactures.—At the beautiful village of Poughkeepsie, situated on the North river, there are now being built six factor is intended for the manufacture of silk goods.—*Balt. Far.*

A French Chemist is said to have condensed carbonic acid gas to a solid state. The temperature required was nearly one hundred degrees below the freezing point.

To Cure the King's Evil.—Mr. Smith: Take of burdock, either tops or roots, and make a strong tea, and drink about a gill, morning, noon, and night; take of the seeds of the same plant, heat them fine, and spread them on a tar plaister; the tar should be put on a piece of leather, and cut a hole in the leather, and let the hole come over the sore.

This is to be continued until the cure is effected; it will take several months in some cases to effect a cure.

Review of Chemistry applied to Agriculture.—By John Anthony Chaptal, Count of Cantaloup, Peer of France, Member of the Institute, &c. This work is laid before the American public as a more modern and perfect treatise of agricultural chemistry, being the results of the labours and studies of an eminent French chemist during many years's experience in such pursuits. Sir Humphrey Davy's Lectures were published in 1813, and ten years afterwards, appeared the first edition of the present work: and, in 1829, a second edition, increased in several particulars. Although almost entirely of a local character there are, nevertheless, several points of interest to every agriculturist applicable to all countries; and some subjects, though often treated before, yet deserving renewed attention. The atmosphere and its influence on vegetation; the nature of soils, and their action; the nature of manures; the vegetable economy and laws relating to the physiology of plants; improvement of soil; succession of crops; treatise on the products of the farm; cultivation of the beet for sugar—are particularly considered. One great merit is its simplicity and great plainness; the reduction of philosophical theory to simple truth.

Chemistry, as indeed the other sciencies, have been too little regarded in connexion with the culture of the soil, and yet thousands are the errors which a better knowledge of what concerns the material on which we expend our labour, might be avoided by a better and closer attention to them. Seldom any thing but long experience, and this too often by the result of costly experiments, acquaint us with the nature of the soil, and what crops will best succeed on this or that

land; or whether it be more or less favourable to the increase of some insect or deleterious parisitic plant, which affects the produce. We could wish that different notions respecting this subject existed, and a yet more general diffusion of the correct and modern system of husbandry. Nor do these remarks apply only to our agriculturists, in the common meaning of the term, but those who minister among the more delicate productions of the garden, would do well to make themselves acquainted with the secret laws which govern the subjects of their care. Invested with these, they may render the barren wilderness a garden, and, like some magician of old, command the rich treasures of the earth to come forth at their bidding.

The Largest Tree in the World.—The boabab or monkey-bread, *(Adamsonia digitata)* is the most gigantic tree hitherto discovered. The trunk, though frequently eighty feet in circumference, rarely exceeds twelve or fifteen feet in height; but on the summit of this huge pillar is placed a majestic head of innumerable branches fifty or sixty feet long, each resembling an enormous tree, dense clothed with beautiful green leaves. While the central branches are erect, the lowest series in a horizontal direction, often touching the ground at their extremity; so that the whole forms a splendid arch of foliage, more like the fragment of a forest than a single tree. The grateful shade of this superb canopy is a favourite retreat of birds and monkeys; the natives resort to it for repose, and the weary traveller in a burning climate gladly flies to it for shelter. The leaves are quinate, smooth, resembling in general form those of the horse-chesnut. The flowers are white and very beautiful, eighteen inches in circumference. The fruit, which hangs in a pendant manner, is a woody gonrd-like capsule with a downy surface, about nine inches in length and four in thickness, containing numerous cells, in which brown kidney-shaped seeds are embedded in a pulpy acid substance. The timber is soft and spongy, and we are not aware that it is used for economical purpose. It is easily perforated, so that, according to Bruce, the bees in Abyssinea construct their nests within it, and the honey thus obtained, being supposed to have acquired a superior flavour, is esteemed in preference to any other. A more remarkable excavation is however made by the natives; diseased portions of the trunk are hollowed out and converted into tombs for the reception of the bodies of such individuals, as by the laws or customs of the country, are denied the usual rites of interment. The bodies thus suspended within the cavity, and without any preparation or embalmmeut, dry into well preserved mummies. The juicy acid pulp is eaten by the natives, and is considered beneficial in fevers and other diseases on account of its cooling properties. The duration of the boabab is not the least extraordinary part of the history, and has given rise to much speculation. In it we unquestionably see the most ancient living specimens of vegetation. "It is," says the illustrious Humboldt, "the oldest organic monument of our planet;" and Adanson calculates that trees now alive have weathered the storms of five thousand years.---*Edinburg Cabinet Library No. XII.---Nubia and Abyssiania.*

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The Scotch Thistle.—This ancient emblem of Scottish pugnacity, with its motto *Nemo me impune lacessit*, is represented of various species in royal bearings, coins, and coats of armour; so that there is some difficulty in saying which is the genuine original thistle. The origin of the national badge itself is thus handed down by tradition: When the Danes invaded Scotland, it was deemed unwarlike to attack an enemy in the pitch darkness of night, instead of a pitched battle by day; but on one occasion the invaders resolved to avail themselves of this stratagem; and in order to prevent their tramp from being heard, they marched barefooted. They had thus neared the Scottish force unobserved, when a Dane unluckily stepped with his naked foot upon a superb prickly thistle, and instinctively uttered a cry of pain, which discoved the assault to the Scots, who ran to their arms, and defeated the foe with a terrible slaughter. The thistle was immediately adopted as the insignia of Scotland.

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Science of Agriculture.—Many people suppose farming to be perfectly an *a, b, c,* business, for which any blockhead is competent; but the celebrated Marshal says, "Agriculture is a subject which, viewed in all its branches, and to their fullest extent, is not only the most important and the most difficult in rural economies, but in the circle of human arts and sciences."

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Roman Great Men.—Varro, in complaining of the decline of agriculture in his days, says that the great men had deserted the corn-fields and vineyards, and employed most of their time in the circus and theatres.

Melons.—The productiveness of melons and cucumbers is increased by nipping off the ends of the vines.